Product Service Manual – X203H

Service Manual for acer: X203H

P/N : 9J.0VH14.T1K

Applicable for All Regions

Version : 001
Date : 2009/5/8

Notice:
- For RO to input specific "Legal Requirement" in specific NS regarding to responsibility and liability statements.

First Edition (May, 2009)
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Abbreviations & Acronyms

1. About This Manual

This manual contains information about maintenance and service of acer products. Use this manual to perform diagnostics tests, troubleshoot problems, and align the acer product.

1.1 Trademark

The following terms are trademarks of Acer Inc. :

Acer

Importance

Only trained service personnel who are familiar with this Acer Product shall perform service or maintenance to it. Before performing any maintenance or service, the engineer MUST read the "Safety Note".

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2. Introduction

This section contains general service information, please read through carefully. It should be stored for easy access place for quick reference.

2.1 RoHS (2002/95/EC) Requirements

– Applied to all countries require RoHS.

The RoHS (Restriction of Hazardous Substance in Electrical and Electronic Equipment Directive) is a legal requirement by EU (European Union) for the global electronics industry which sold in EU and some counties also require this requirement. Any electrical and electronics products launched in the market after June 2006 should meet this RoHS requirements. Products launched in the market before June 2006 are not required to compliant with RoHS parts. If the original parts are not RoHS complaints, the replacement parts can be non ROHS complaints, but if the original parts are RoHS compliant, the replacement parts MUST be RoHS complaints.
If the product service or maintenance require replacing any parts, please confirming the RoHS requirement before replace them.

2.2 Safety Notice

1. Make sure your working environment is dry and clean, and meets all government safety requirements.
2. Ensure that other persons are safe while you are servicing the product.
   DO NOT perform any action that may cause a hazard to the customer or make the product unsafe.
3. Use proper safety devices to ensure your personal safety.
4. Always use approved tools and test equipment for servicing.
5. Never assume the product's power is disconnected from the mains power supply. Check that it is disconnected before opening the product's cabinet.
6. Modules containing electrical components are sensitive to electrostatic discharge (ESD). Follow ESD safety procedures while handling these parts.
7. Some products contain more than one battery. Do not disassemble any battery, or expose it to high temperatures such as throwing into fire, or it may explode.
8. Refer to government requirements for battery recycling or disposal.

2.3 Compliance Statement

Caution: This Optical Storage Product contains a Laser device. Refer to the product specifications and your local Laser Safety Compliance Requirements.

2.4 General Descriptions

This Service Manual contains general information. There are 3 levels of service:
Level 1: Cosmetic / Appearance / Alignment Service
Level 2: Circuit Board or Standard Parts Replacement
Level 3: Component Repair to Circuit Boards

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3. Product Overview

3.1 Introduction

X203H is defined as our new 20'W model in ACER V series which will be the ACER project in Qisda. X203H is defined as 20'W LCD Monitor supports 1600(H) x 900(V) resolution with DPMS (Display Power Management System) and ACER eColor function. There are double input types, D-sub, and DVI. X203H adopts SEC LTM200KT03 and LGD LM200WD1-TLC1. V203H has included 1W+1W speaker.X203H also support ACM 10000:1.

The features summary is shown as below,

*All panel spec. in Q201 definition depends on the variance of panel source.

*All spec. of monitor need to warm up at least 1hr.

* To test the "Contrast Ratio" and "Luminance" functions, the color status must be "User preset" mode.

* 1. "Contrast Ratio": Set "brightness" at 100, and "contrast" at 50.

* 2. "Luminance": Set "brightness" at 100, and "contrast" at 100.

Feature items	Specifications	Remark
Panel supplier & module name	SEC LTM200KT03 LGD LM200WD1-TLC1	TN, Normally white
Screen diagonal	20W"	
Display Format	1600(H) x 900 (V)	Panel Display information
Pixel Pitch	276.8 um x 276.8um	per one triad
Viewing Angle (@ Contrast Ratio >= 10)	SEC LTM200KT03 R/L:160 degrees (typ) U/D: 160 degrees (typ) LGD LM200WD1-TLC1 R/L:170 degrees (typ) U/D: 160 degrees (typ)	
Analog interface with Scaling supported	Yes	With 15-pin D-sub connector
HDMI interface with Scaling supported	No	Only For 1A2H model
Panel native resolution supported	1600 (H) x 900 (V)@60Hz	
Number of Display Colors supported	16.7 Millions	RGB 6-bit +Hi-FRC
Contrast Ratio	1000:1 (typ.), 700:1(min)	Test Condition: Set Contrast at 50, Brightness at 100, Color at User preset
1. ACM	10000:1	
2. Luminance	250 cd/m^2 (typ.),200 cd/m^2 (min)	Test Condition: Set Contrast at 50, Brightness at 100,

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		Color at User preset
AC power input	Yes	90-264 Volts, 47-63 Hz.
DC power input (with AC power adapter)	No	
DPMS supported	Yes	≤1W
LED indicator for power status showed	Yes	Blue/Amber
OSD for control & information supported	Yes	
Multi-language supported for OSD	Yes	EMEA Non-EMEA
Buttons control supported	Yes	6 buttons including 1 monitor power on/off control button.
Flywheel control supported	No	
Scaling function supported	Yes	
Auto adjustment function supported	Yes	
DDC function supported (EDID ver. 1.3)	Yes	DDC2B
DDC-CI support version 1.1 or later	Yes	DDC-CI
Audio speakers supported	Yes	
Audio Jack (input connector) supported	Yes	Line-in connector
Earphone Jack (Output connector) supported	No	
Microphone function supported	No	
Mechanical Tilt base design	Yes	From -5 to +23 degree
VESA wall mounting design	Yes	
Mechanical Rotate design	No	
Mechanical Lift base design	No	
Kensington compatible lock design	Yes	

3.2 Operational Specification

3.2.1 Power supply

Item	Condition	Spec	OK	N.A	Remark
Input Voltage range	Universal input full range	90~264VAC /47~63Hz	√		
Input Current range	90 ~ 264VAC	≤ 2.0 Arms	√		
Power Consumption	Normal “On” operation	**< 33 W**	√		LED: Blue
DPMS	DPMS “Sleep” state	≤ 1 W	√		LED: Amber
DPMS	DPMS “Off” state	≤ 0.5 W	√		LED: OFF
Inrush Current	110 VAC 220 VAC	**< 30 A (peak)** **< 60 A (peak)**	√		Cold-start
Earth Leakage Current	264 VAC/50Hz	< 3.5 mA	√		
Hi-Pot	1. 1500VAC, 1 sec 2. Ground test: 30A, 1sec	Without damage < 0.1 ohm	√		(on-line test) (in-lab test)
Power Line Transient	IEC1000-4-4	1KV	√		

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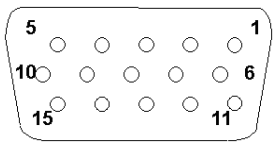
	IEC1000-4-5 (Surge)	Common: 2KV, Differential: 1KV	√		
CCFL operation range	90 ~ 264VAC	LGD: 2.5mA~8.0mA SEC: 3.0mA~8.5mA	√		Depends on panel source
CCFL Frequency	90 ~ 264VAC	40KHz ~ 70KHz	√		Depends on panel source
Power cord		Color: Black Length: 1800 +/- 50 mm	√		

3.2.2 Signal interface

Item	Condition	Spec	OK	N.A	Remark
Signal Cable	15-pin D-Sub	Color: Black Length: 1800 +/- 30 mm	√		
	24-pin DVI-D	Color: Black Length: 1800 +/- 50 mm		√	
Pin assignment	15-pin D-sub connector	See Note-1	√		For 15-pin D-sub
	24-pin DVI-D connector	See Note-2	√		For 24-pin DVI-D
	19-pin HDMI connector	See Note-3		√	For 19-pin HDMI
Analog input	Signal type	Separate analog R/G/B	√		For 15-pin D-sub
	Level	700 mV (peak to peak)	√		
	Impedance	75 Ohms +/- 1.5 Ohms	√		
Sync input	Signal type	Separate H/V-sync Composite H/V-sync (Positive/Negative)	√		For 15-pin D-sub
	Level	Logic High: 2.4V ~ 5.5V Logic Low: 0V ~ 0.5V (TTL level)	√		Refer to VESA VSIS Standard V1R1
	Impedance	Minimum 2.2KΩ(pull down)	√		10KΩ for application
	Sync Pulse Width (SPW)	0.7μs < H-SPW 1H < V-SPW	√		
Digital input	Level	600mV for each differential line	√		
	Impedance	50 Ohm TDR Scan needed for DVI cable and interface board	√		

Note-1: The pin assignment of 15-pin D-sub connector is as below,



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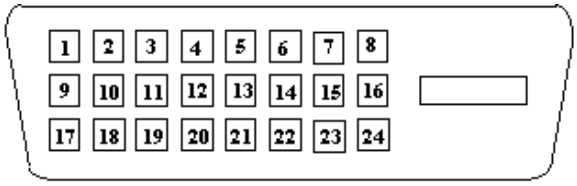
Pin	Signal Assignment	Pin	Signal Assignment
1	Red video	9	PC5V (+5 volt power)
2	Green video	10	Sync Ground
3	Blue video	11	Ground
4	Ground	12	SDA
5	Cable Detected	13	H-Sync (or H+V)
6	Red Ground	14	V-sync
7	Green Ground	15	SCL
8	Blue Ground		

Note-2: The pin assignment of 24-pin DVI-D connector is as below,



Pin	Signal Assignment	Pin	Signal Assignment
1	TMDS RX2-	13	Floating
2	TMDS RX2+	14	+5V Power
3	TMDS Ground	15	Ground
4	Floating	16	Hot Plug Detect
5	Floating	17	TMDS RX0-
6	DDC Clock	18	TMDS RX0+
7	DDC Data	19	TMDS Ground
8	Floating	20	Floating
9	TMDS RX1-	21	Floating
10	TMDS RX1+	22	TMDS Ground
11	TMDS Ground	23	TMDS Clock+
12	Floating	24	TMDS Clock-

3.2.3 Video performance

Item	Condition	Spec	OK	N.A	Remark
Max. support Pixel rate		151.25 MHz	√		Both for analog and digital inputs
Max. Resolution		1600 x 9000	√		Both for analog and digital inputs
Rise time + Fall time		< 5 ms (50% of minimum pixel clock period)	√		1600x900 @ 60Hz (max. support timing)
Settling Time after overshoot /undershoot		< 5% final full-scale value	√		Refer to VESA VSIS Standard V1R1
Overshoot/Undershoot		< 12% of step function voltage level over the full voltage range	√		Refer to VESA VSIS Standard V1R1

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3.2.4 Scan range

Item	Condition	Spec	OK	N.A	Remark
Horizontal		31-83 KHz	√		
Vertical		56-76 Hz	√		HDMI supports 50Hz

3.2.5 Plug & Play DDC2B DDC-CI Support

Item	Condition	Spec	OK	N.A	Remark
DDC channel type		DDC2B	√		
EDID		Version 1.3	√		Refer to S/W spec. document to see the detailed EDID data definition.
DDC-CI		Version 1.1 or Later	√		Refer to S/W spec

3.2.6 Support Timings

640x480@60Hz	800 x 525	31.469	59.941	25.175
640x480@72Hz	832 x 520	37.861	72.809	31.500
640x480@75Hz	840 x 500	37.500	75.000	31.500
640x480@66.66Hz	864x525	35	66.66	30.24
720x400@70Hz	900x449	31.469	70.087	28.322
800x600@56Hz	1024 x 625	35.156	56.250	36.000
800x600@60Hz	1056 x 628	37.879	60.317	40.000
800x600@72Hz	1040 x 666	48.077	72.188	50.000
800x600@75Hz	1056x625	46.875	75.000	49.500
832x624@74.55Hz	1152x667	49.722	74.55	57.28
1024x768@60Hz	1344x806	48.363	60.004	65.000
1024x768@70Hz	1328x806	56.476	70.069	75.000
1024x768@75Hz	1312x800	60.023	75.029	78.750
1152x870@75Hz	1456x915	68.681	75.062	100.000
1152x864@75Hz	1600x900	67.5	75	108
1280x960@60Hz	1800x1000	60	60	108
1280x1024@60Hz	1688x1066	63.981	60.020	108.000
1280x1024@75Hz	1688x1066	79.976	75.025	135.000
1280x720@60Hz	1650x750	44.955	59.940	74.176
1280x800@60Hz	1680x831	49.702	59.810	83.500
1360x768@60Hz	1792x795	47.712	60.015	85.500
1600x900@60Hz	2122x934	55.990	59.946	118.250
1600x900@60Hz_RB	1800x1000	60.000	60.000	108.000
1600x900@75Hz	2144x942	70.546	74.889	151.250

Note:

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1. Show “Input Not Supported” warning message.

   When Vertical Frequency is over 76Hz or under 56Hz, the display is Black and showing “Input Not Supported” warning message. (HDMI supports 50Hz for PAL video signals.)

2. If Hf /Vf is set in the range of 31KHz~83KHz and 56Hz ~76Hz, but is not the above Resolution, then it will display the nearest mode.

3.3 Operational & Functional Specification

3.3.1 Video performance

***All spec. of monitor need to warm up at least 1hr.**

SEC LTM200KT03

Item	Condition	Spec	OK	N.A	Remark
Resolution	Any input resolution modes which are under 1600x900	1600x900	√		
Contrast ratio		1000(typ.)	√		Test Condition: Set Contrast at 50, Brightness at 100, Color at User preset.
Brightness	At R/G/B saturated condition	250 cd/m^2 (typ.),200 cd/m^2 (min)	√		Test Condition: Set Contrast at 50, Brightness at 100, Color at User preset.
Response time	Rising + Falling time	On/off:5 ms (typ.),10ms(max)	√		Test Equipment: Westar TRD 100 or equal level equipment ;
Viewing angle	At Contrast ratio = 10	R/L: 80/80 degrees (typ.) 70/70 degrees (min)	√		
	At Contrast ratio = 10	U/D: 80/80 degrees (typ.) 70/70 degrees(min)	√		
CIE coordinate of White		(0.31, 0.33) +/- (0.03, 0.03)	√		
Display colors		16.7 Millions colors	√		6 bit+Hi-FRC

LGD LM200WD1-TLC1

Item	Condition	Spec	OK	N.A	Remark
Resolution	Any input resolution modes which are under 1600x900	1600x900	√		
Contrast ratio		700(min),1000(typ.)	√		Test Condition: Set Contrast at 50, Brightness at 100, Color at User preset.

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Brightness	At R/G/B saturated condition	250 cd/m^2 (typ.),200 cd/m^2 (min)	√		Test Condition: Set Contrast at 50, Brightness at 100, Color at User preset.
Response time	Rising + Falling time	On/off:5 ms (typ.),10ms(max)	√		Test Equipment: Westar TRD 100 or equal level equipment ;
Viewing angle	At Contrast ratio = 10	R/L: 85/85 degrees (typ.) 70/70 degrees (min)	√		
	At Contrast ratio = 10	U/D: 75/85 degrees (typ.) 60/70 degrees(min)	√		
CIE coordinate of White		(0.31, 0.33) +/- (0.03, 0.03)	√		
Display colors		16.7 Millions colors	√		6 bit+Hi-FRC

3.3.2 Brightness Adjustable Range

Item	Condition	Spec	OK	N.A	Remark
Brightness adjustable range	At default contrast level (saturate point) & Full-white color pattern	(Max. brightness value – ● Min. brightness value) ≧ 100 cd/㎡	√		

3.3.3 Acoustical Noise

Item	Condition	Spec	OK	N.A	Remark
Acoustical Noise	At 30 cm distance	≦ 22 dB/A	√		Refer to C326

3.3.4 Environment

Item	Condition	Spec	OK	N.A	Remark
Temperature	Operating	0 ~ +40 ℃	√		
	Non-operating	-20 ~ +65 ℃	√		
Humidity	Operating	20 ~ 80%	√		Non-condensing
	Non-operating	20 ~ 80%	√		Non-condensing
Altitude	Operating	12,000 feet at 25℃	√		Without packing
	Non-operating	40,000 feet at -30 ℃	√		With packing

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3.3.5 Transportation

Item	Condition	Spec	OK	N.A	Remark
(1) Vibration	Package, Non-Operating	Test Specification: 1. Frequency Hertz 5 ~ 250 HZ , PSD Level 0.0054 (G2/Hz) 2. Grms = 1.146 3. Sweep Time : 30 minutes per Axis 4. Axes : X,Y,Z	√		
(2) Unpackaged Vibration	Unpackaged, Non-Operating	Test Spectrum: 20 Hz 0.0185(g2/Hz) 200Hz 0.0185(g2/Hz) Duration : 5 Minutes Axis : 3 axis (Horizontal and Vertical axis ,Z axis)	√		
(3) Drop	Package, Non-Operating	76 cm Height (MP stage) (1 corner, 3 edges, 6 faces)	√		
(4) Shock	Wooden package, Non-Operating	1. Amplitude : Half sine-wave 50G 2. Duration : 10 ms 3. Test Times : 1 4.Test Sides : All 6 Sides	√		

3.3.6 Electrostatic Discharge Requirements

Item	Condition	Spec	OK	N.A	Remark
Electrostatic Discharge	IEC801-2 standard	Contact: 8KV Air: 15KV	√		

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3.3.7 EMC

Item	Condition	Spec	OK	N.A	Remark
TCO03	Electric	Band 1 < 10 V/m Band 2 < 1 V/m	√		
	Magnetic	Band 1 < 200nT Band 2 < 25nT	√		
EMI	FCC part 15J class B	After Mass production under 1dBuv for constant measure. Besides DNSF and VCCI class-2 are optional.	√		
	EN55022 class B				

3.3.8 Reliability

Item	Condition	Spec	OK	N.A	Remark
MTBF Prediction	Refer to MIL-217F	> 60,000 Hours	√		Excluding CCFL
CCFL Life time	At 25±2℃, under 7.0mA	40,000 Hours (min)	√		See Note-4

Note-4: CCFL lifetime is determined as the time at which brightness of lamp is 50%. The typical lifetime of CCFL is on the condition at 7.0mA lamp current.

3.3.9 Audio performance

Item	Condition	Spec	OK	N.A	Remark
Preamp + Power amp					
(1)Output power		1 Wrms/CH @ 1KHz	√		
(2)THD (@ 1W)		<1%	√		
(3)S/N ratio		>40dB	√		
Speaker Driver					
(1)Nominal impedance		8 ohm	√		
(2)Rated input power		1 W/CH	√		
(3)Frequency response		500~20KHz SPL-10dB	√		
(4)Output sound pressure level		80 ± 3 dB (1W 0.5M)	√		
(5)Dimension of box		63x25x13mm^2	√		
Audio Control					
(1)Volume range		0 ~100 levels	√		
(2)Mute		On/Off		√	

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3.4 LCD Characteristics

3.4.1 The Physical definition & Technology summary of LCD panel

SEC LTM200KT03

Item	Condition	Spec	OK	N.A	Remark
LCD Panel Supplier		SEC	√		
Panel type of Supplier		LTM200KT03	√		
Screen Diagonal		20.0” Diagonal	√		
Display area	Unit=mm	442.8(H) x 249.075(V)	√		
Physical Size	Unit=mm	462.8(H) x272.0(V) x 17.5(D)	√		
Weight	Unit=gram	2600 (max.)	√		
Technology		TN type	√		
Pixel pitch	Unit=um	276.8(H) x276.8 (W)	√		Per one triad
Pixel arrangement		R/G/B vertical stripe	√		
Display mode		Normally White	√		
Support color		16.7Millions colors	√		6 bit + HiFRC

LGD LM200WD1-TLC1

Item	Condition	Spec	OK	N.A	Remark
LCD Panel Supplier		LGD	√		
Panel type of Supplier		LM200WD1-TLC1	√		
Screen Diagonal		20.0” Diagonal (508.05 mm)	√		
Display area	Unit=mm		√		
Physical Size	Unit=mm	462.8(H) x272.0(V) x 14.5(D)	√		
Weight	Unit=gram	1620 (typ.)	√		
Technology		TN type	√		
Pixel pitch	Unit=um	92.2xRGB (H) x276.6 (W)	√		Per one triad
Pixel arrangement		R/G/B vertical stripe	√		
Display mode		Normally White	√		
Support color		16.7Millions colors	√		6 bit + HiFRC

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3.4.2 Optical characteristics of LCD panel

SEC LTM200KT03

Item	Unit	Conditions	Min.	Typ.	Max.	Remark
Viewing Angle	[degree]	Horizontal (Right)	70	80	-	
	[degree]	CR = 10 (Left)	70	80	-	
	[degree]	Vertical (Up)	70	80	-	
	[degree]	CR = 10 (Down)	70	80	-	
Contrast ratio		Normal Direction		1000		
Response Time	[msec]	Rising Time	-			
	[msec]	Falling Time	-			
	[msec]	Rising + Falling	-	5	10	
Color / Chromaticity Coordinates (CIE)		Red x		0.650		
		Red y		0.335		
		Green x		0.295		
		Green y		0.605		
		Blue x		0.145		
		Blue y		0.075		
Color Coordinates (CIE) White		White x		0.313		
		White y		0.629		
Luminance Uniformity	[%]	9 points measurement	75	80		
White Luminance @ CCFL 7.0mA (center)	[cd/m^2]		200	250	-	
Crosstalk (in 75Hz)	[%]					

LGD LTM200WD1-TLC1

Item	Unit	Conditions	Min.	Typ.	Max.	Remark
Viewing Angle	[degree]	Horizontal (Right)	70	80	-	
	[degree]	CR = 10 (Left)	70	80	-	
	[degree]	Vertical (Up)	60	75	-	
	[degree]	CR = 10 (Down)	70	80	-	
Contrast ratio		Normal Direction	700	1000		
Response Time	[msec]	Rising Time	-	1.1	2.6	
	[msec]	Falling Time	-	3.9	7.4	
	[msec]	Rising + Falling	-	5.0	10.0	
Color / Chromaticity Coordinates (CIE)		Red x	0.643	0.646	0.649	
		Red y	0.331	0.334	0.337	
		Green x	0.300	0.303	0.306	
		Green y	0.613	0.616	0.619	
		Blue x	0.144	0.147	0.150	
		Blue y	0.064	0.067	0.170	
Color Coordinates (CIE) White		White x	0.310	0.313	0.316	
		White y	0.326	0.329	0.332	
Luminance Uniformity	[%]	9 points measurement	75			
White Luminance @ CCFL 7.0mA (center)	[cd/m^2]		200	250	-	
Crosstalk (in 75Hz)	[%]				1.5	

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3.5 User Controls

3.5.1 User's hardware control definition

Item	Condition	Spec	OK	N.A	Remark
Power button			√		
Auto button(Exit button)			√		
Right/Inc. button			√		
Left/Dec. button			√		
Menu button			√		
Mode button				√	
Input Select button				√	
E-Key button			√		
Mute button				√	

3.5.2 OSD control function definition

Item	Condition	Spec	OK	N.A	Remark
Auto Adjust		Auto-Geometry	√		
Brightness			√		
Contrast			√		
Horizontal Position			√		
Vertical Position			√		
Clock			√		
Foucs			√		
Color		Cool(9300K) Warm(6500K) User: Separate R/G/B adjustment	√		
OSD Position		OSD Horizontal position OSD Vertical position	√		
OSD Time out		From 10 sec to 120 sec	√		
OSD Lock				√	
Language		EMEA/Non-EMEA languages for Asia/Europe Version	√		
Recall		Recall All	√		
Input Select		D-sub DVI	√		
Sharpness				√	
Display Information		For input timing	√		
Volume			√		
Mute				√	
Hot key for Auto			√		
Hot key for Contrast				√	
Hot key for Volume			√		Right/left key
Hot key for Input Select				√	
Hot key for Mode				√	
Wide mode		Full/Aspect	√		
ACM		ON/OFF	√		
DDC-CI		ON/OFF	√		

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Acer eColor Management		User/Text/Standard/Graphic/Movie	√		
Exit			√		

PS: “E-key” +” Power” to enter factory mode
The detailed firmware functions’ specification, please refer to C212 S/W spec. document.

3.6 Mechanical Characteristics

3.6.1 Dimension

Item	Condition	Spec	OK	N.A	Remark
Bezel opening		444.81*251.21 mm	√		
Monitor without Stand	W x H x D mm	491.25*305.93*62.2 mm	√		
Monitor with Stand	W x H x D mm	491.25*356.53*177.41 mm	√		
Carton Box (outside)	L x W x H mm	540*134*411mm	√		
Tilt and Swivel range		Tilt: -5 ~ +15 degree Swivel: 0 degree	√		

3.6.2 Weight

Item	Condition	Spec	OK	N.A	Remark
Monitor (Net)	4.1Kg	**4.1Kg**	√		
Monitor with packing (Gross)	5.6 **kg**	5.6 **kg**	√		

3.6.3 Plastic

Item	Condition	Spec	OK	N.A	Remark
Flammability		**>ABS<,94-HB**	√		
Heat deflection To	**ABS**	65 ℃	√		
UV stability	**ABS**	**Delta E < 8.0**	√		
Resin		1.BEZEL/BASE:ABS 2.UC/CLMN:ABS	√		
Texture		**Uc:AT-IM-D02;** **Bezel: AT-IM-D01**	√		
Color		**BEZEL : DB19A;** **UC: DB19A**	√		

3.6.4 Carton

Item	Condition	Spec	OK	N.A	Remark
Color		**Kraft**	√		
Material		**B Flute**	√		
Compression strength		**200KGF**	√		
Burst Strength		**16 KGF/cm^2**	√		
Stacked quantity		5 Layers Vertical	√		

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3.7 Pallet & Shipment

3.7.1 Container Specification

Stowing Type	Container	Quantity of products (sets) (Every container)	Quantity of Products (sets) (Every Pallet)	Quantity of pallet (sets) (Every Container)
With pallet	20'	900	Pallet A: 90	Pallet A: 10
			Pallet B:	Pallet B:
	40'	1800	Pallet A: 90	Pallet A: 20
			Pallet B: X	Pallet B: X
Without pallet	20'		X	X
			X	X
	40'		X	X
			X	X

3.7.2 Carton Specification

3.7.2.1 Product:

Net Weight (Kg)	Gross Weight (Kg)	Dimension w/o Base W*H*D (mm)	Dimension w/ Base W*H*D (mm)
4.1**kg**	5.6 **kg**	**mm**	**mm**

3.7.2.2 Package:

Carton Interior Dimension (mm) L*W*H	Carton External Dimension (mm) L*W*H
532*126*399mm	**540*134*411mm**

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3.8 Certification

Item	Condition	Spec	OK	N.A	Remark
Environment	Green design	API Doc. 715-C49	√		ISO14000 Requirement
	Blue Angel	German Standard		√	
	E-2000	Switzerland		√	
	EPA	USA Standard	√		
	TCO'99			√	
	TCO'03		√		
	MPR2		√		
	Green Mark		√		
PC-Monitor	Microsoft Windows	PC98/99	√		
	DPMS	VESA	√		
	DDC 2B	Version 1.3	√		
	USB	External		√	
Safety	UL (USA)	UL60950 3rd edition		√	
	CSA (Canada)	CAN/CSA-C22.2 No. 60950	√		
	Nordic / D.N.S.F	EN60950		√	
	FIMKO	EN60950		√	
	CE Mark	73/23/EEC	√		
	CB	IEC60950	√		
	CB	EN60950	√		
	TUV/GS	EN60950 / EK1-ITB 2000:2003		√	
	CCC (China)	CB4943	√		
	GOST	EN60950	√		
	TUV type-approved		√		
	SASO	IEC60950		√	
EMC	CE Mark	89/336/EEC	√		
	FCC (USA)	FCC Part 15 B	√		
	EN55022	Class B		√	
	CISPR 22	Class B		√	
	VCCI (Japan)	VCCI Class B	√		
	BSMI (Taiwan)	CNS 13438	√		
	C-Tick (Australia)	AS/ NZS CISPR22	√		

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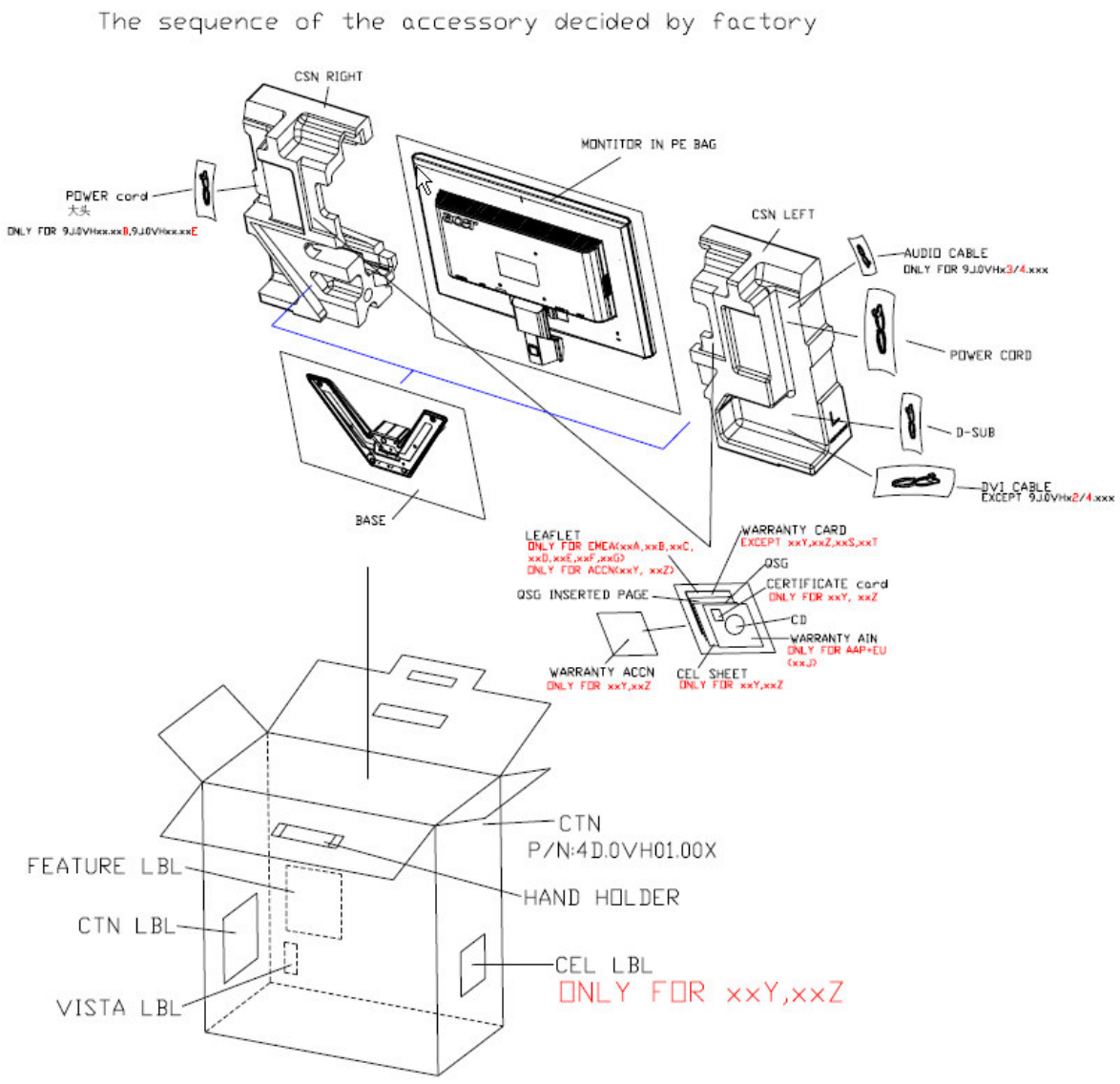
X- Ray Requirement	DHHS (21 CFR)	USA X- Ray Standard		√	
	DNHW			√	
	PTB	German X- Ray standard		√	
Ergonomics	TUV / Ergo			√	
	ISO 13406-2		√		
	prEN50279			√	

3.9 Packing



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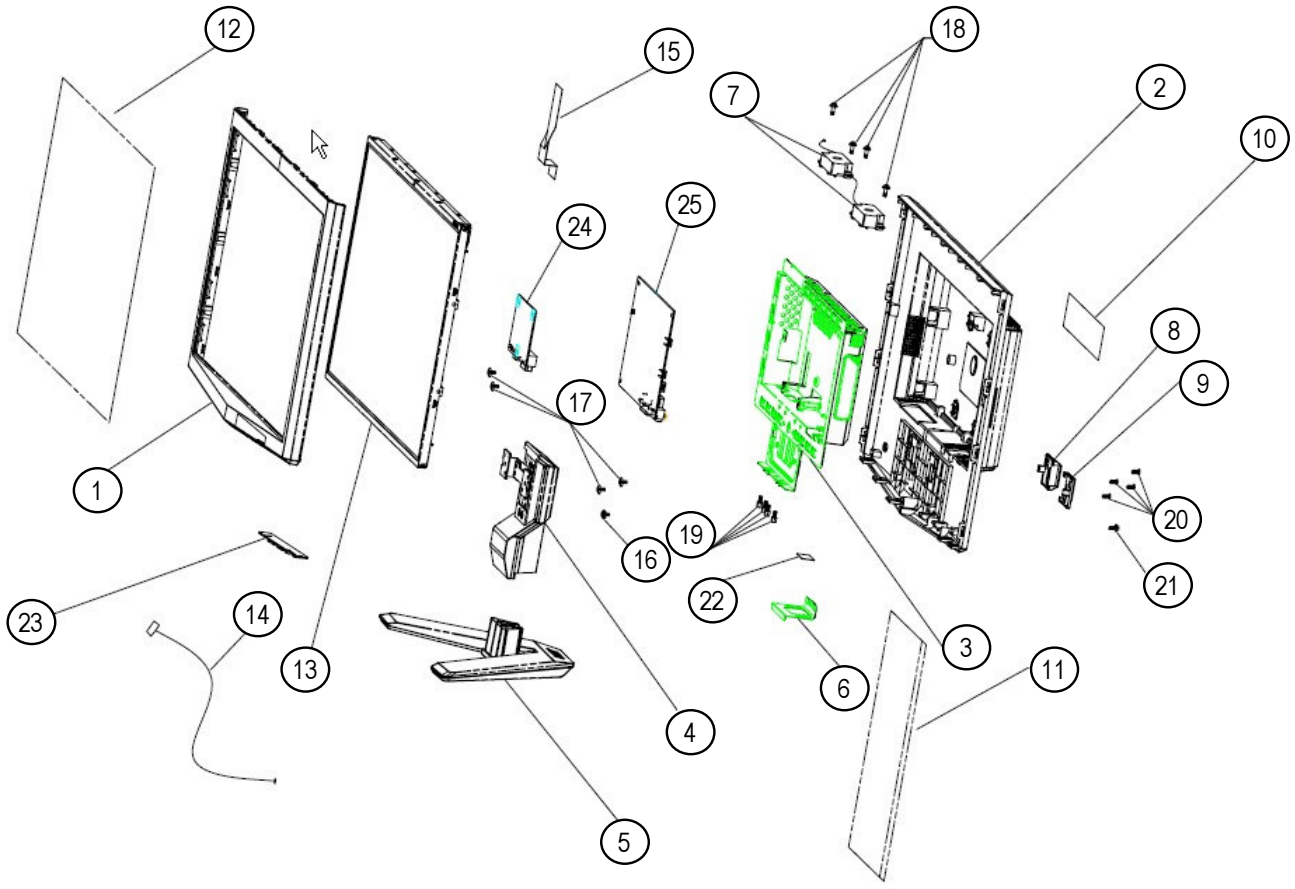
4. Disassembly /Assembly

4.1 Exploded View



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25	5E.0UH02.001	PCBA SPS BD AUDIO SEC MI V203H		1	
24	5E.0VH01.012	PCBA IF BD MI X203H SEC D+SPK		1	
23	5E.0GT03.M01	PCBA CTRL BD SMD P22XW		1	
22	4K.05502.001	MYLAR PC 24.5*14*0.5 1708FPb	PART	1	
21	8F.WA314.8R0	SCRW MACH FLAT M4*8L C-ZN NYLO	PART	1	
20	8F.5A456.8R0	SCRW MACH FLAT M4*8L C-ZN NYLO	PART	4	
19	8F.205B4.019	SCRW MACH STEEL HEX #4-40 0.3 NI	PART	4	
18	8F.00518.100	SCRW TAP W/FL M3*10L(S3.8) ZN	PART	4	
17	8F.00273.6R0	SCRW TAP PH W/FL M3*6L C-ZN	PART	4	
16	8F.00010.161	SCRW TAPTILE TRS W/EXT M4*8L	PART	1	
15	5K.0TB02.N01	FFC LVDS 30P NO SILVER G2020HD	PART	1	
14	5K.0GT01.021	WIRE CTRL 7/9P 350MM X203H	PART	1	
13	5F.LS1AP.001	LCDM20W LTM200KT03 ACER	Panel	1	
12	4K.0VH01.001	FILM EPE 465*272 X203H	PART	1	
11	4G.0RW03.001	FOIL AL MYLAR 270*80 VH203	PART	1	
10	4E.0GT01.111	LBL SPEC 89.5*49.5 WW X203H	PART	1	
9	4B.0GT05.021	CVR HINGE L ABS DB19A P22XW	PART	1	
8	4B.0GT06.021	CVR HINGE R ABS DB19A P22XW	PART	1	
7	2C.409C0.051	SPK*2 8OHM 1.5W 145/390MM	PART	1	
6	3K.0TB03.001	BKT AC-IN SPTE 0.3T G2020HD	PART	1	
5	6K.0K306.001	ASSY BASE DUAL X223W	ASSEMBLY	1	
4	6K.0K304.001	ASSY CLMN ABS DB19A X223W	ASSEMBLY	1	
3	6K.0VH10.001	ASSY SHD SEC DUAL SPK X203H	ASSEMBLY	1	
2	6K.0VH02.001	ASSY RC SEC DUAL SPK X203H	ASSEMBLY	1	
1	6K.0VH01.001	ASSY BZL DB19A X203H	ASSEMBLY	1	
ITEM	PART NO.	DESCRIPTION	TYPE	QTY	VENDOR

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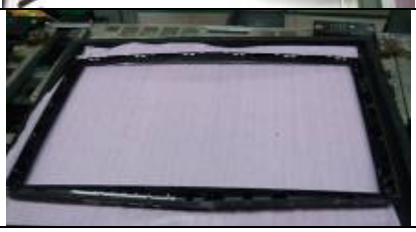
4.2 Disassembly /Assembly

4.2.1 Assembly SOP

Preparation before assemble

1. Clean the room for work
2. Identify the area for material
3. Prepare the implement, equipments, materials as bellow:
   1) Press-fixture
   2) working table
   3) Screw-driver
   4) knife*1
   5) glove
   6) cleaning cloth
   7) ESD protection

item	picture	Operation	Tool	Notes
1		Stick the big Al tape to panel which can protect the Light-wire.		The tape must cover the connect of the wire
2		Check and put CLM-F on the cushion carefully,		
3		Assemble the panel on CLM-F.		Go to with Left.

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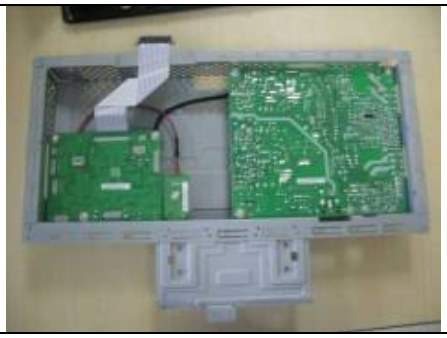
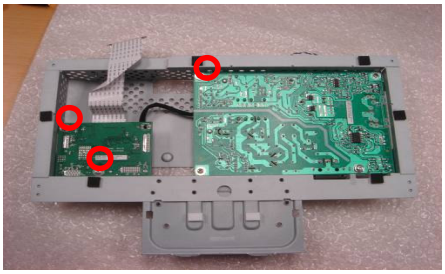
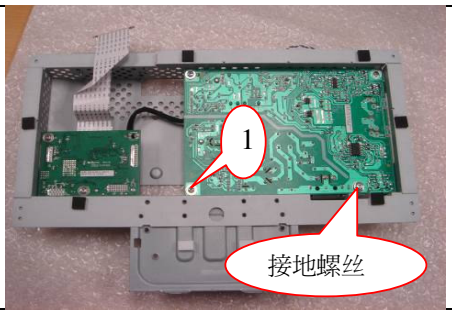
4		Assemble the SPK to the main-SHD, the correct position reference on the picture, then the lock 4 screws to fasten it.	Screw-driver	Keep the ware in.
5		Assemble the FFC to the I/F, the correct position reference on the picture		Without the gap within
6		Assemble the PCBA to Main-SHD		
7		Lock 3 screws on the PCBA board with this order.	Screw-driver	
8		Lock 2 screws on the SPS board with order.	Screw-driver	

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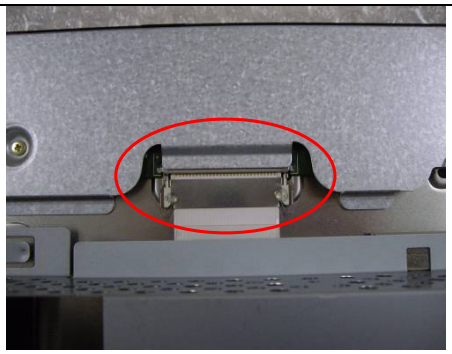
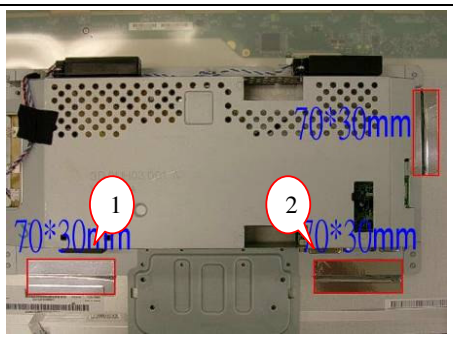
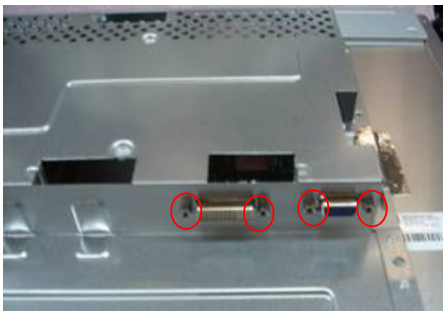
9		Scan for fooling	PC	Card go with panel.
10		Fasten the LVDS to panel and fix the Main-BKT to CLM-F		
11		Stick one Al foil on the right between pane land Main-BTK only for SEC panel		
12		Stick two pieces of Al foil on the under between panel and Main-BTK only for SEC panel		The position refer to the picture
13		Lock screws of side on Main-Chassis with 2/4,based on DVI.	Screw-driver	Attention the order by one to four.

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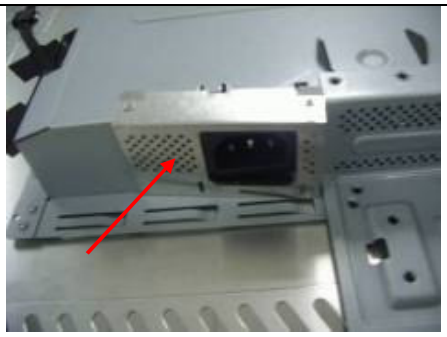
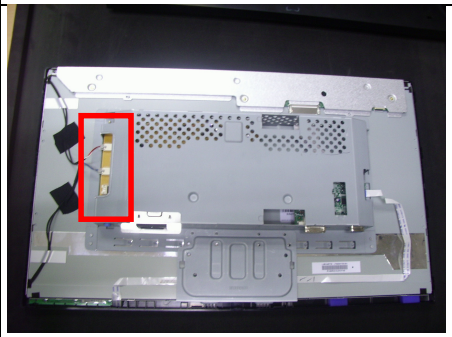
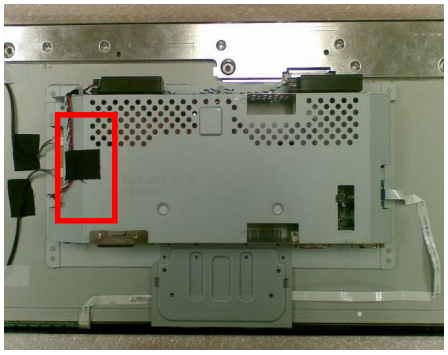
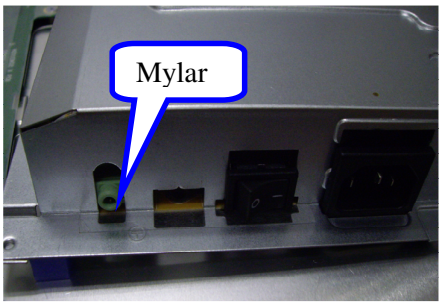
14		Assemble the L-SHD the correct position reference on the picture		
15		Insect the inverter wire one by one and insect the speaker wire		Keep all wires in.
16		Stick a tap to fix the speaker wire		The tap must not stick to the part of the IF
17		Stick a Mylar under the audio connector		

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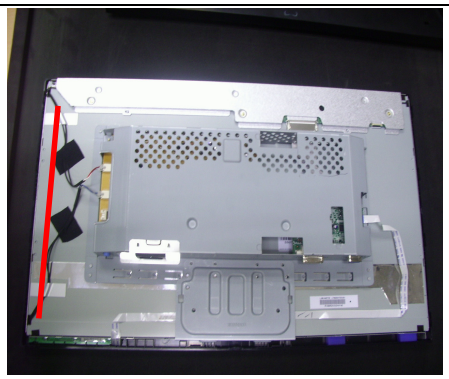
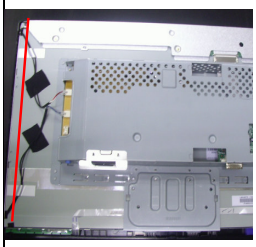
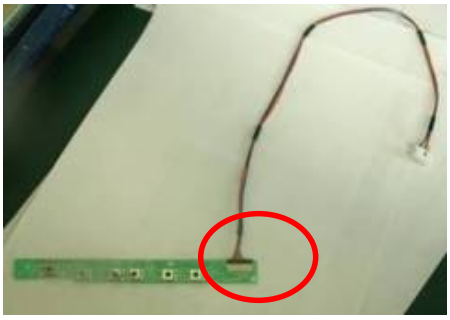
18		Stick an acetic tape to fix the wire one by one as the picture		Not fix the panel to the edge 
19		Fix the big Al tape to panel		
20		Assemble the C/B wire to the C/B connect		
21		Assemble the C/B to the BZL and insert the C/B wire to the I/F BD		

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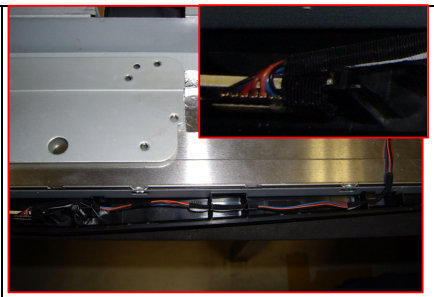
22		Fix the C/B wire to the BZL		
23		Check and put CLM-F on the Main-Chassis carefully.		None hurt outside.
24		Assemble the Rear Cover.		
25		Check and put CLM-abs on working table carefully and assemble them together		

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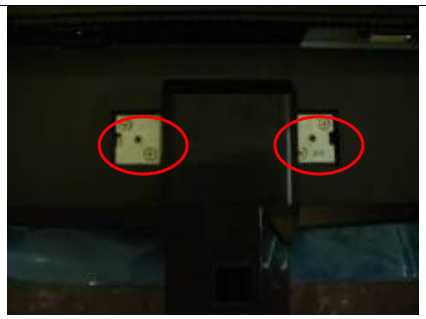
26		Assemble the Hinge to the CLM-abs		
27		Lock screws*6 onto the hinge with screw-driver	Screw-driver	
28		Lock 4 screws to RC.	(FABF-DSSDA1-***） 60-80mm ＃2 9±1kg.cm	
29		Cover the CLM of L and R		

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4.2.2 Disassembly SOP

Preparation before disassemble

1. Clean the room for disassemble
2. Identify the area for monitor
3. Check the position that the monitors be placed and the quantity of the monitor ;prepare the area or material flow; according to the actual condition plan the disassemble layout
4. Prepare the implement, equipments, materials as bellow:
   1) Press-fixture
   2) Working table
   3) Screw-driver
   4) Knife*1
   5) Glove
   6) Cleaning cloth
   7) ESD protection

item	picture	Operation	Tool	Notes
1		Disassemble the stand → 4 screws	Screw-driver	Kick the board first.
2		Disassembly the bezel from the monitor, notice the disassembly order : 1.Left (1) parts of bezel 2.Top (2) parts of bezel 3.Bottom (3) parts of bezel 4. Right (4) parts of bezel Don't draw the BZL		When disassembly the bezel ,notice don't bend the C/B .man must wear glove The purpose is loose the BZL
3		Turn over the monitor ,dismantle the Rear cover from the monitor		

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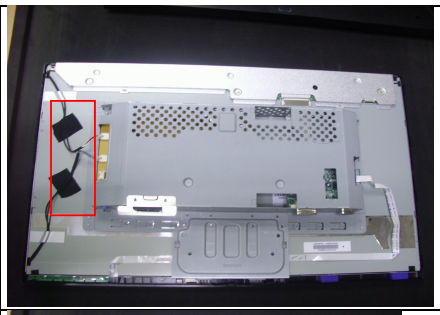
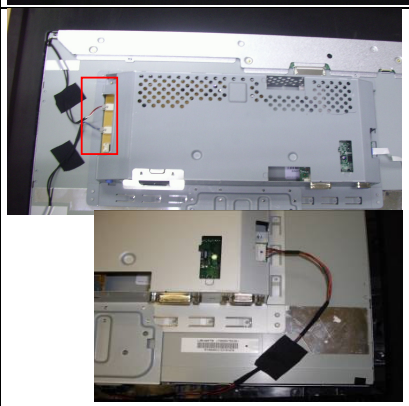
4		Tear out the acetic tape		
5		Unlock the wires.		
6		Disassembled the SHD shielding : 5 screw	Screw-driver	
7		Tear down three pieces of Al foil		

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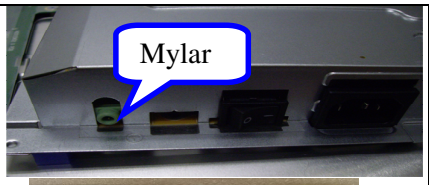
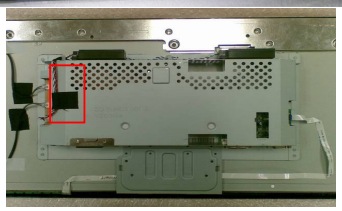
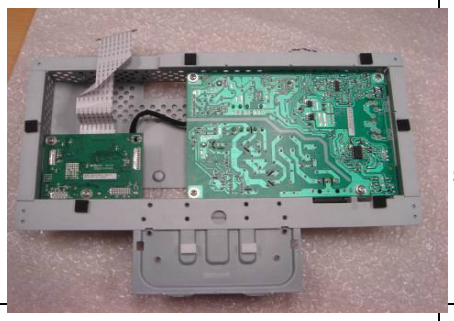
8	 	Tear down the Mylar and the tap		
9		Disassembled the AC-soc shielding .		
10		Unlock the LVDS wires.		
11		Disassembled the PCBA shielding : 5 screws	Screw-driver	
12		Disassembled the SPK shielding : 4 screws	Screw-driver	

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13		Get off the panel from the bezel		
14		Get off the big tap from the tape		
15		Disassemble the control board		

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5. Level 1 Cosmetic / Appearance / Alignment Service

5.1 Alignment procedure (for function adjustment)

5.1.1 Preparation

1. Setup **input** timing to any preset modes or patterns.
2. Enter factory mode (press “Empowering” & “Power” buttons at the same time to turn on monitor).
3. Move cursor into “Burn-in Mode” tag and select “On” to enable burn-in mode.
4. Power off the monitor, remove the input source and then power on again.
5. Setup unit and keep it warm up for at least 30 minutes.
6. Setup input timing ICL-605(1280x1024@75Hz), 32-Grays pattern.
7. Setup unit and keep it warm up at least 30 minutes.

5.1.2. Timing adjustment:

1. Enter factory setting area (press “Empowering” and then press “SOFTPOWER”).
2. Check the settings to following values:

   Contrast = 50

   Brightness = 85

   Color = Warm

   Language = English

   Then, turn off the monitor power.
3. Turn on power enter user area.

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Figure-1: Preset Timing modes list

640x480@60Hz	800 x 525	31.469	59.941	25.175
640x480@72Hz	832 x 520	37.861	72.809	31.500
640x480@75Hz	840 x 500	37.500	75.000	31.500
640x480@66.66Hz	864x525	35	66.66	30.24
720x400@70Hz	900x449	31.469	70.087	28.322
800x600@56Hz	1024 x 625	35.156	56.250	36.000
800x600@60Hz	1056 x 628	37.879	60.317	40.000
800x600@72Hz	1040 x 666	48.077	72.188	50.000
800x600@75Hz	1056x625	46.875	75.000	49.500
832x624@74.55Hz	1152x667	49.722	74.55	57.28
1024x768@60Hz	1344x806	48.363	60.004	65.000
1024x768@70Hz	1328x806	56.476	70.069	75.000
1024x768@75Hz	1312x800	60.023	75.029	78.750
1152x870@75Hz	1456x915	68.681	75.062	100.000
1152x864@75Hz	1600x900	67.5	75	108
1280x960@60Hz	1800x1000	60	60	108
1280x1024@60Hz	1688x1066	63.981	60.020	108.000
1280x1024@75Hz	1688x1066	79.976	75.025	135.000
1280x720@60Hz	1650x750	44.955	59.940	74.176
1280x800@60Hz	1680x831	49.702	59.810	83.500
1600x900@60Hz	2122x934	55.990	59.946	118.250
1600x900@60Hz_RB	1800x1000	60.000	60.000	108.000
1600x900@75Hz	2144x942	70.546	74.889	151.250

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5.1.3 ADC calibration (Auto color balance adjustment)

~~Analog only, it is not required for DVI-D input source

1. Setup input timing ICL-605(1280x1024@75Hz), pattern 42(5-Mosaic pattern with white color block) with Analog signals from Chroma video pattern generator. (it depends on Scaler IC supplier's recommendation)
2. Enter factory mode (press "Empowering" & "Power" buttons at the same time to turn on monitor).
3. Move cursor into "Burn-in Mode" tag and select "On" to enable burn-in mode.
4. Close OSD menu then press "Auto" button for auto color adjustment. (This procedure will get optimal gain/offset(clamp) values)
5. Checking if the picture is ok, or reject this monitor and check its circuit board or wire/cable connection.

5.1.4 Color temperature adjustment

1. Setup input timing to any preset modes, pattern 41(full white color pattern) with Analog signals from Chroma video pattern generator.
2. Enter factory mode (press "Empowering" & "Power" buttons at the same time to turn on monitor).
3. Move cursor into "Burn-in Mode" tag and select "On" to enable burn-in mode.
4. Make sure ADC calibration (auto color balance adjustment) had already been done.
5. Measure color temperature by Minolta CA-110 (or equivalent equipment).
6. Adjust the color temperature ~~ Two methods can be used to adjust RED, GREEN, BLUE value of each color temperature, C0/Cool, C1/User & C2/Warm to meet following spec requirement, the 1st method is by using external PC and IIC alignment protocol to do automatic adjustment, and the 2nd method is by manually and must be in factory mode.

Color temperature (C0/cool on OSD)	X+-	0.283+(-) 0.03
	Y+-	0.297+(-) 0.03
	Luminance	
Color temperature (C1/User on OSD)	X+-	
	Y+-	
	Luminance	
Color temperature (C3/Warm on OSD)	X+-	0.313+(-) 0.03
	Y+-	0.329+(-) 0.03
	Luminance	

7. Move cursor into "Burn-in Mode" tag and select "No" to disable burn-in mode.
8. Turns off the monitor power.

5.1.5. Writing EDID data into monitor

1. Setup a **PC** with DDC card.
2. Connect PC to monitor with a D-sub signal cable.
3. Please refer to the Q212 for the correct EDID file.
4. Runs the writing program to write the analog EDID data into EEPROM for analog input(ie. 15-pin D-sub).

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5. Repeat step 4 and write the digital EDID data into EEPROM for DVI-D input(ie. 24-pin DVI-D).
6. Read both EEPROM data and confirm it to match with the Q212 definition.

(Note : The DVI-D input may not operation correctly if the digital EDID data do not exist.)

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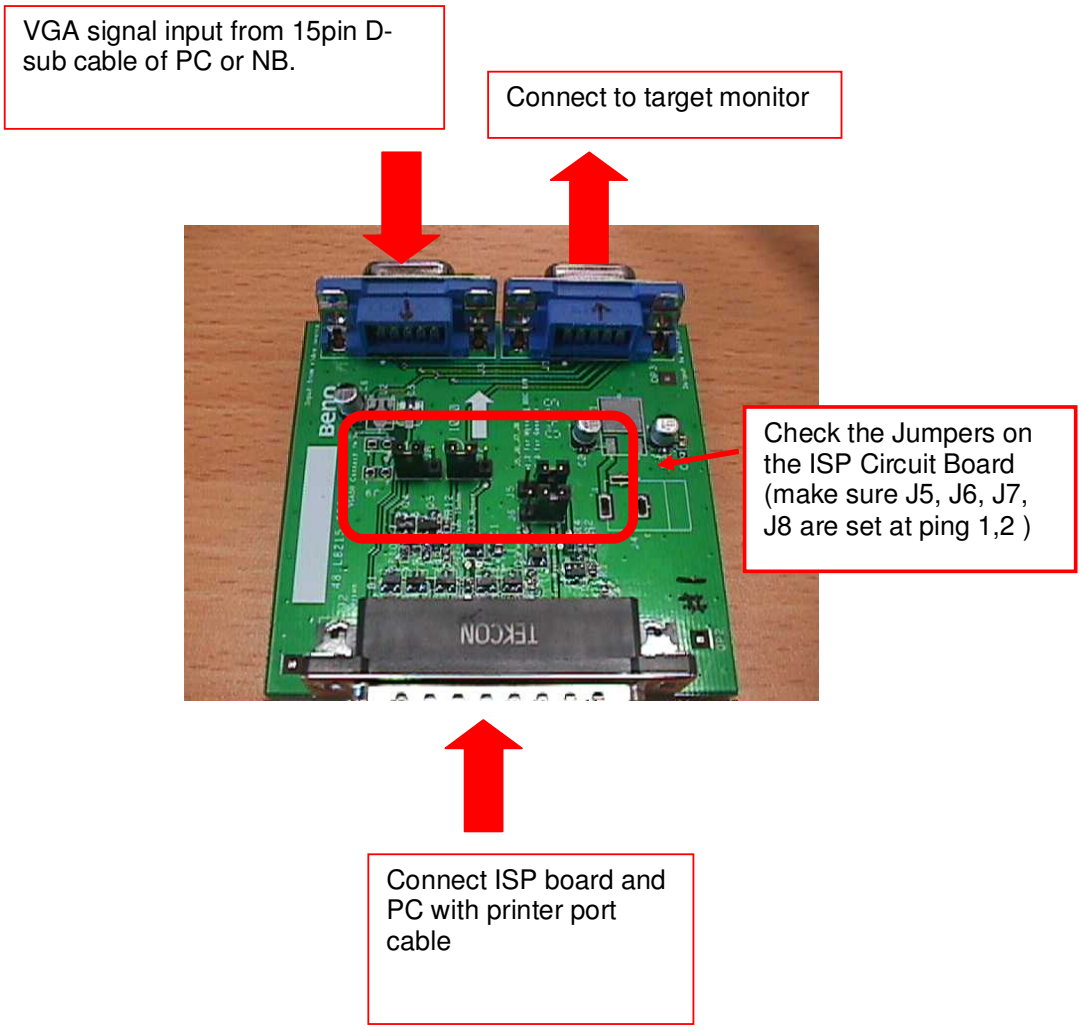
5.2 Software / Firmware Upgrade Process

5.2.1 Hardware prepared:

Hardware Requirement:

1. ISP board x 1


VGA signal input from 15pin D-sub cable of PC or NB.
Connect to target monitor
Check the Jumpers on the ISP Circuit Board (make sure J5, J6, J7, J8 are set at ping 1,2)
Connect ISP board and PC with printer port cable

2. DSUB VGA cables x 2
3. Printer cable (with one male connector and another female connector) x 1.
4. PC or Notebook with parallel (printer) port x1.

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5.2.2 Firmware Upgrade Procedure

Step 1:

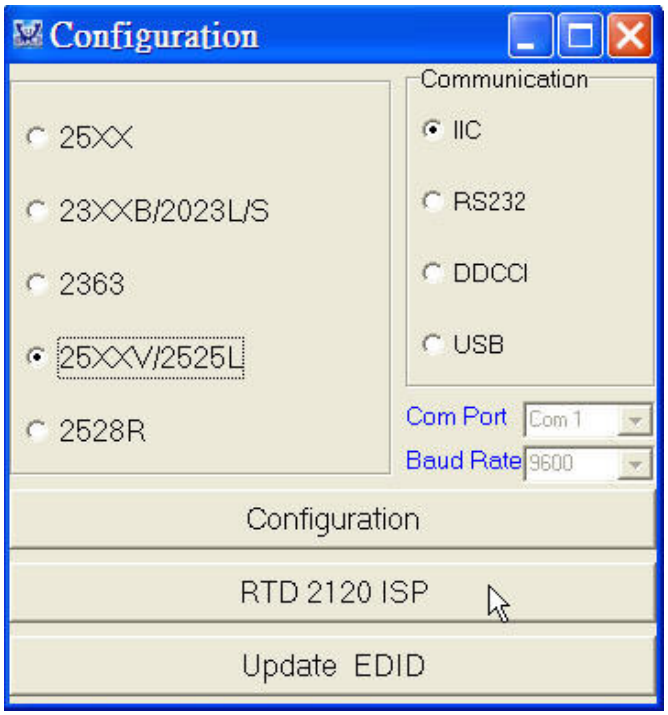
Un-zip Port95nt and install into your computer.

Step 2:

Un-zip ISP application tool (RTDTool)

Step 3:

Press “RTD 2120 ISP” button to execute firmware program application.



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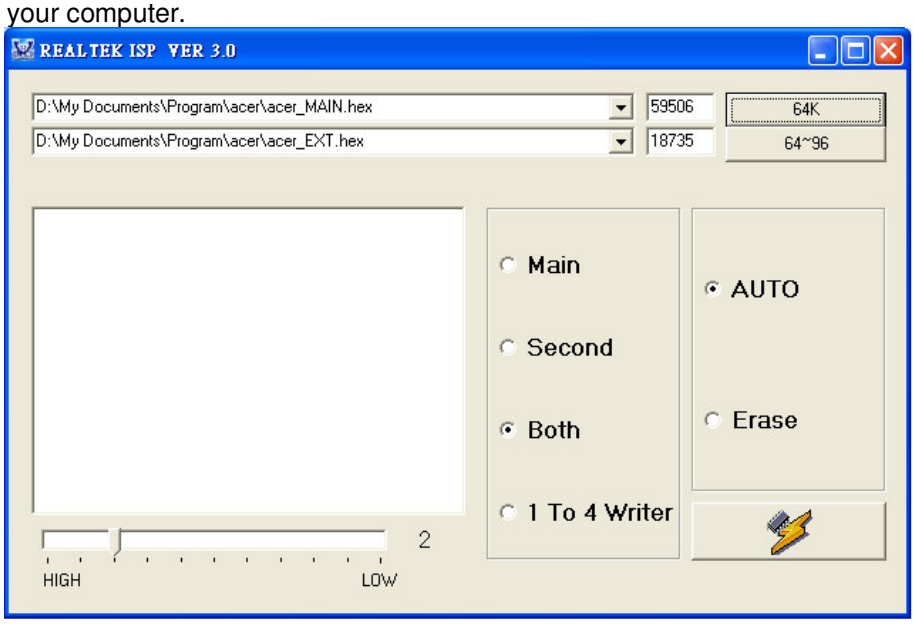
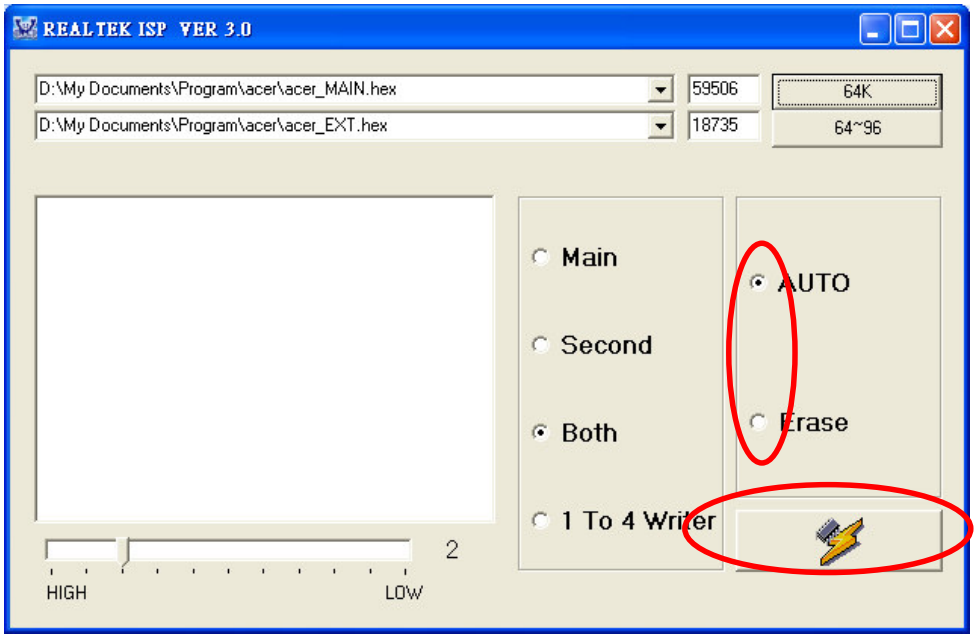
Step 4:

Press “64K” button to load *series*.hex file and press “64~96” button to load *extend*.hex file from your computer.



Step 5:

Select “Erase” option and execute lightning button first, and then select “Auto” option and execute lightning button to start upgrade firmware to the monitor.



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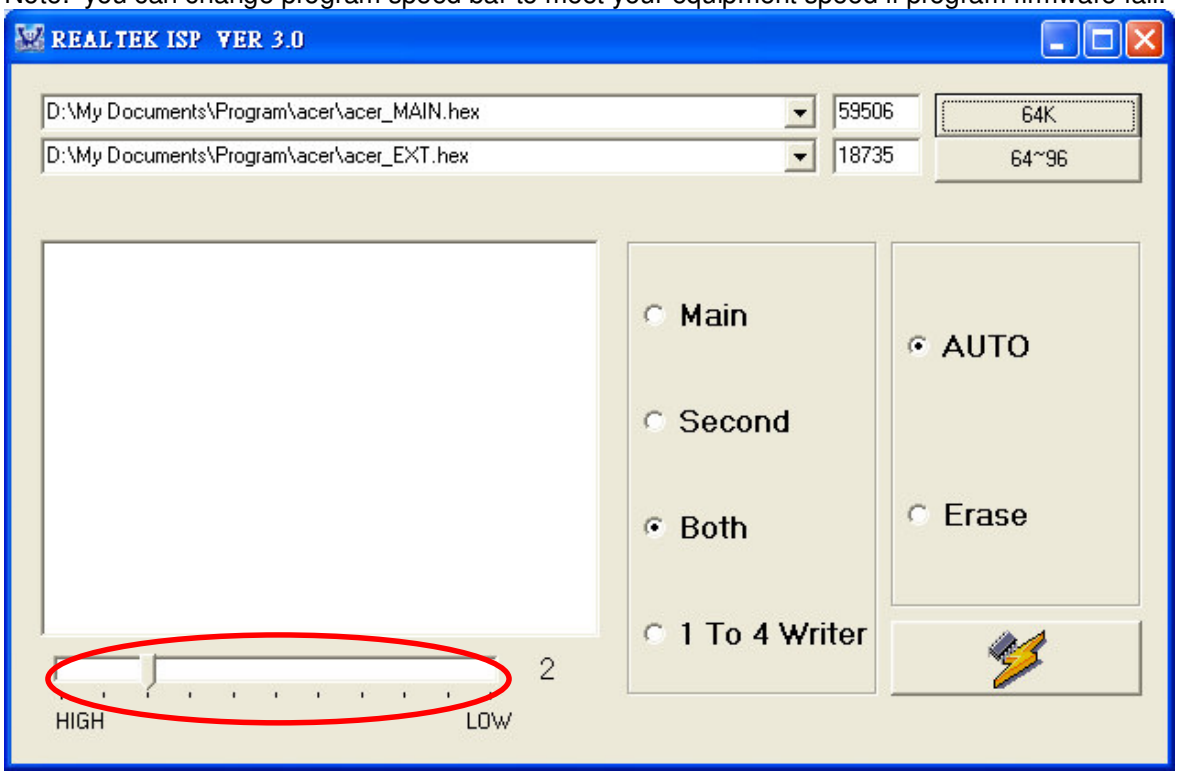
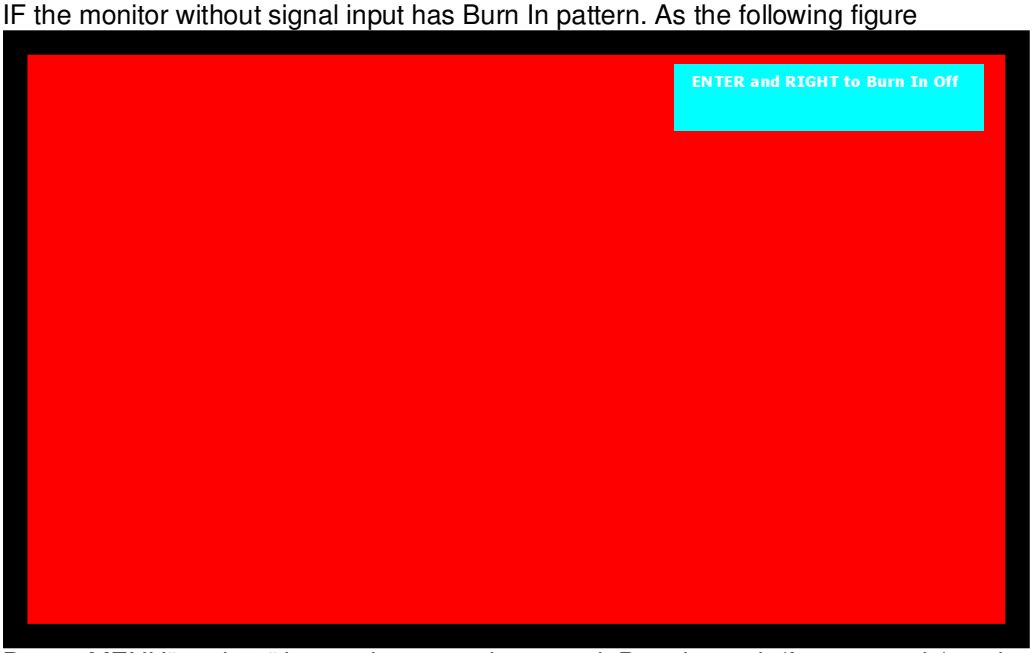
Note: you can change program speed bar to meet your equipment speed if program firmware fail.



5.2.3 Turn Off Burn In

IF the monitor without signal input has Burn In pattern. As the following figure



Press “MENU” and “>” key at the same time to exit Burn in mode(factory mode),and soft power key off/on restart the monitor.

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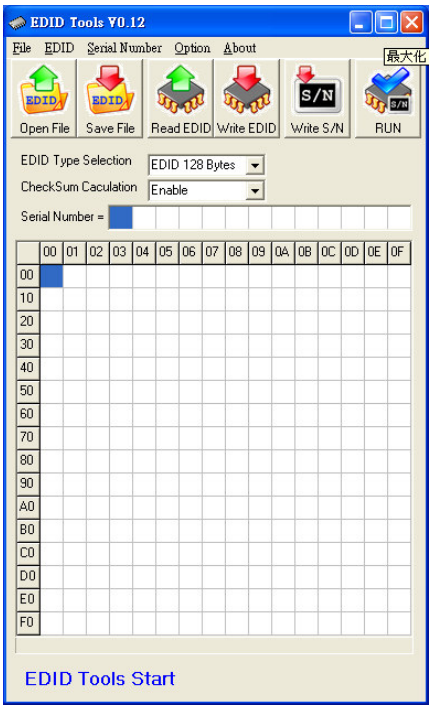
5.3 EDID Upgrade Procedure

Step 1:

Run the program “Q-EDID-V012.exe”, when the UI popped up


EDID Tools V0.12
File EDID Serial Number Option About
最大化
Open File
Save File
Read EDID
Write EDID
Write S/N
RUN
EDID Type Selection
EDID 128 Bytes
CheckSum Caculation
Enable
Serial Number =
00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F
00 10 20 30 40 50 60 70 80 90 A0 B0 C0 D0 E0 F0
EDID Tools Start

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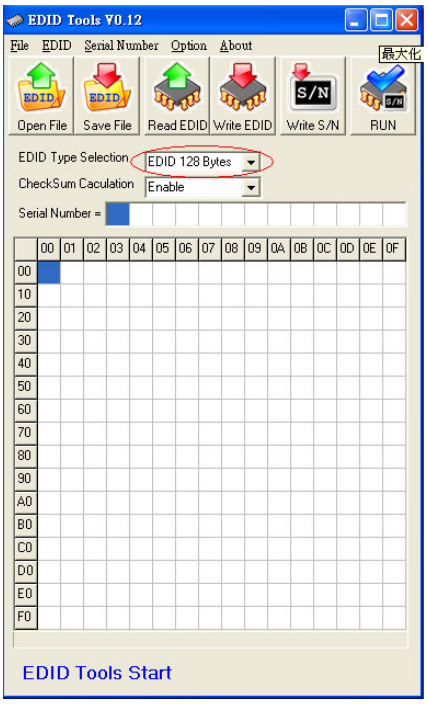
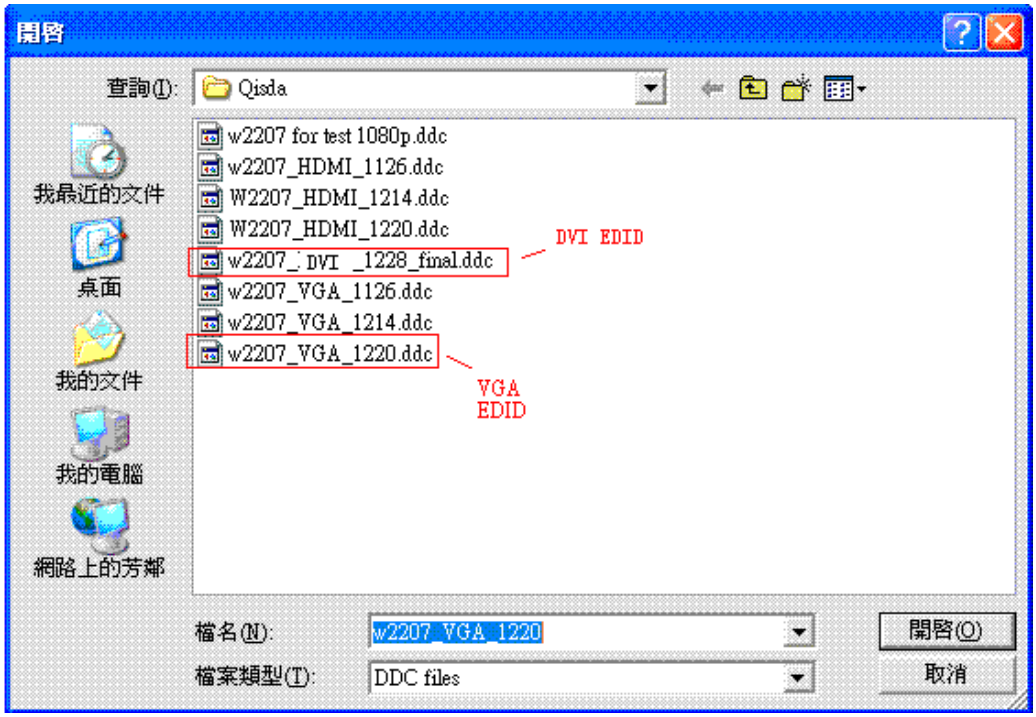
Note: If “VGA” choose 128bytes, and “DVI” choose 128bytes



Step 2:

Click “Open File” and select “VGA” or “DVI” EDID file



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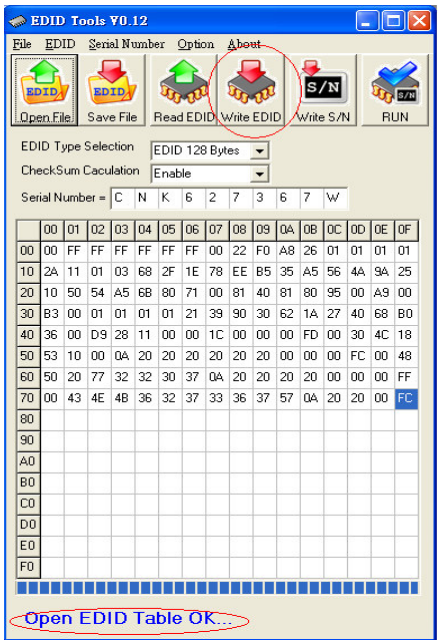
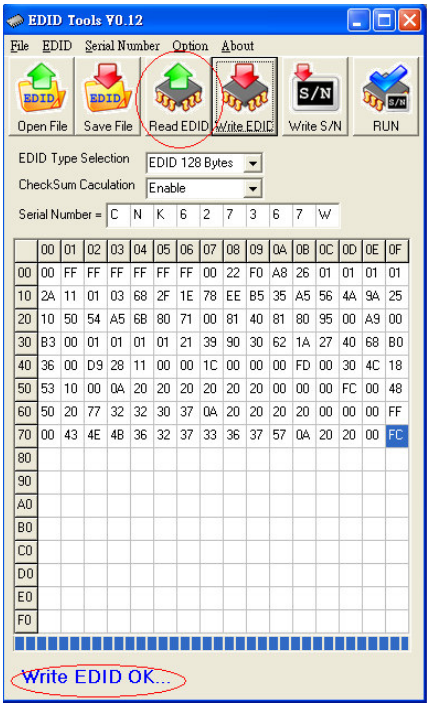
Step 3:

If load file is successful, it shows “Open EDID Table OK..”.
And then, Click “Write EDID” button to update EDID



Step 4:

If write EDID is successful, it shows”Write EDID OK …”
And then, Click “Read EDID” button to check if successful or not.



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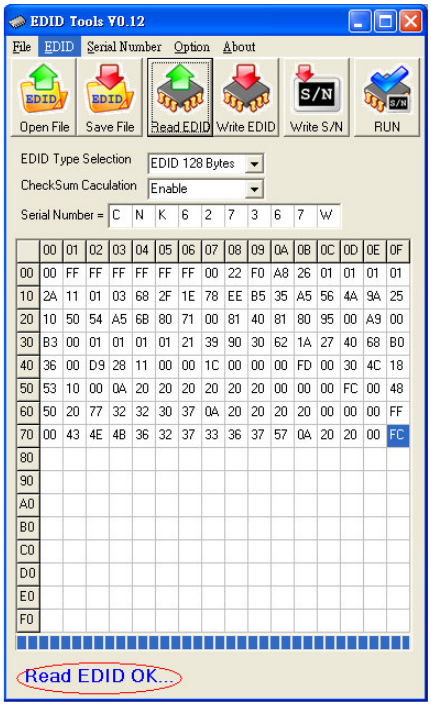
Step 5:

If read EDID is successful, it shows”Read EDID OK …”



	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	00	FF	FF	FF	FF	FF	FF	00	22	F0	A8	26	01	01	01	01
10	2A	11	01	03	68	2F	1E	78	EE	B5	35	A5	56	4A	9A	25
20	10	50	54	A5	6B	80	71	00	81	40	81	80	95	00	A9	00
30	B3	00	01	01	01	01	21	39	90	30	62	1A	27	40	68	B0
40	36	00	D9	28	11	00	00	1C	00	00	00	FD	00	30	4C	18
50	53	10	00	0A	20	20	20	20	20	20	00	00	00	FC	00	48
60	50	20	77	32	32	30	37	0A	20	20	20	20	00	00	00	FF
70	00	43	4E	4B	36	32	37	33	36	37	57	0A	20	20	00	FC
80																
90																
A0																
B0																
C0																
D0																
E0																
F0																

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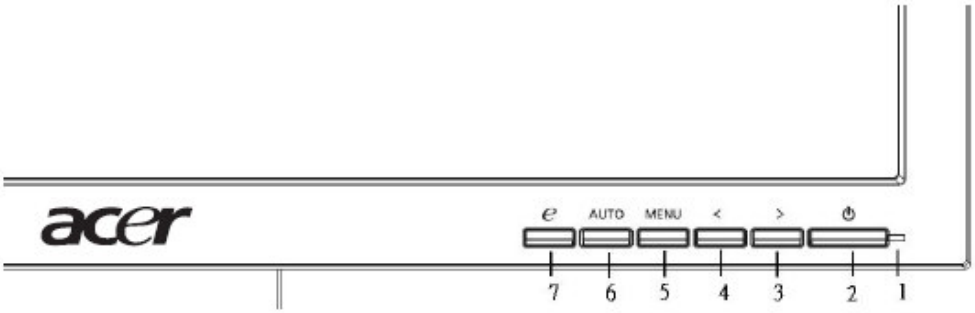
5.4 OSD Operation Guide

User controls



Front panel controls

1 Power LED: Lights up to indicate the power is turned on.

2 Power switch: Turns the power on or off.

3.4 < / > : Press < or > to navigate to the desired function, press Enter to select the function. Press < or > to change the settings of the current function.

5 Menu/Enter: Activate the OSD menu when the OSD is off or activate/ deactivate the adjustment function when the OSD is on.

6 Auto adjust button/Exit:

- a When the OSD menu is active, this button will act as the exit key (OSD menu).
- b When the OSD menu is inactive, press this button for two seconds to activate the Auto Adjustment function. The Auto Adjustment function is used to set the HPos, VPos, Clock and Focus.

7 Empowering Key/Exit:

- a When the OSD menu is active, this button will act as the exit key (exit OSD menu).
- b When the OSD menu is inactive, press this button to select scenario mode.

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How to adjust a setting

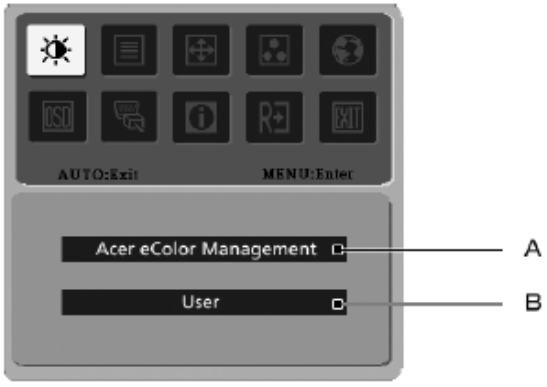
1 Press the Menu button to activate the OSD window.

2 Press < or > to select the desired function.

3 Press the Menu button again to select the function that you want to adjust.

4 Press < or > to change the settings of the current function.

5 To exit and save, select the exit function. If you want to adjust any other function, repeat steps 2 to 4.



A Acer eColor Management: If "Acer eColor Management" is selected, the Acer eColor Management OSD will appear.

B User: If "User" is selected, the standard OSD will appear.

I. Only analog-input mode

II. Only digital-input mode

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User

Main menu icon	Sub menu icon	Sub menu item	Description
		Contrast	Adjusts the contrast between the foreground and background of the screen image.
		Brightness	Adjusts the background brightness of the screen image.
		ACM	ACM (Adaptive Contrast Management) ACM On/Off switch, default Off.
		Focus	Adjusts picture focus (available in analog mode only).
		Clock	Adjusts the picture clock (available in analog mode only).
		H. Position	Adjusts the horizontal position of the OSD (available in analog mode only).
		V. Position	Adjusts the vertical position of the OSD (available in analog mode only).
	N/A	Warm	Sets the color temperature to warm white.
	N/A	Cool	Sets the color temperature to cool white.
		User/red	Adjusts red intensity.
		User/green	Adjusts green intensity.
		User/blue	Adjusts blue intensity.

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Main menu icon	Sub menu icon	Sub menu item	Description
	N/A	English	Language selection.
	N/A	繁體中文	
		Deutsch	
		Français	
		Español	
		Italiano	
		简体中文	
		日本語	
		Suomi	EMEA version OSD only.
		Hollands	
		Русский	
		H. Position	Adjusts the horizontal position of the OSD.
		V. Position	Adjusts the vertical position of the OSD.
		OSD Timeout	Adjusts the OSD timeout.
	N/A	Analog	Selects input signal from analog (D-sub).
	N/A	Digital (only dual-input models)	Selects input signal from digital (DVI) (only dual-input models).
	N/A	DDC/CI	Turns on/off DDC/CI support
	N/A	Information	Shows the resolution, H/V frequency, input port and serial number for current input.
	N/A	Reset	Clears Auto-configuration changes and sets the color temperature to warm.
	N/A	Exit	Saves user changes and closes the OSD.

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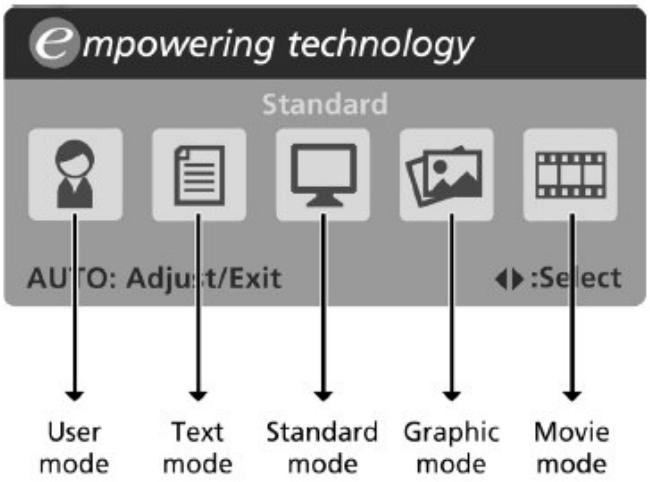
Acer eColor Management

- Operation instructions

  1 Press the e Empowering Key to open the Acer eColor Management OSD and access the scenario modes.
  2 Press "<" or ">" to select the mode.
  3 Press the Auto-adjust button to confirm the mode and run Auto Adjust.



- Features and benefits

Main menu icon	Sub menu item	Description
	User mode	User-defined. Settings can be fine-tuned to suit any situation.
	Text mode	Optimal balance of brightness and contrast to prevent eyestrain. The most comfortable way to read onscreen text.
	Standard mode	Default settings, reflects native display capability.
	Graphic mode	Enhances colors and emphasizes fine detail. Pictures and photographs appear in vibrant colors with sharp detail.
	Movie mode	Displays scenes in clearest detail. Presents great visuals, even in unsuitably-lit environments.

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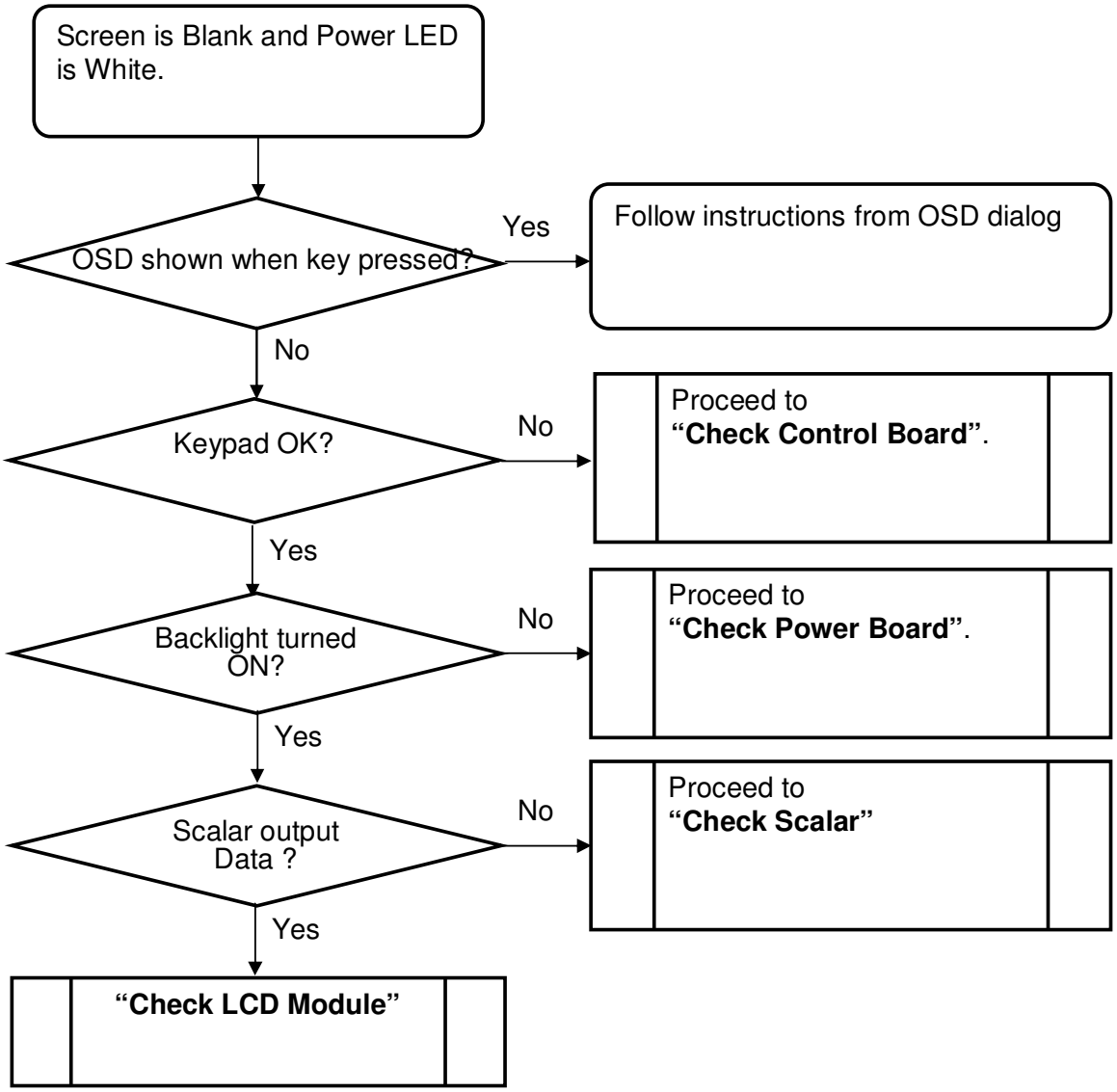
6. Level 2 Circuit Board and Standard Parts Replacement

6.1 Trouble Shooting Guide

6.1.1 No Display or display is unstable (Interface Board)



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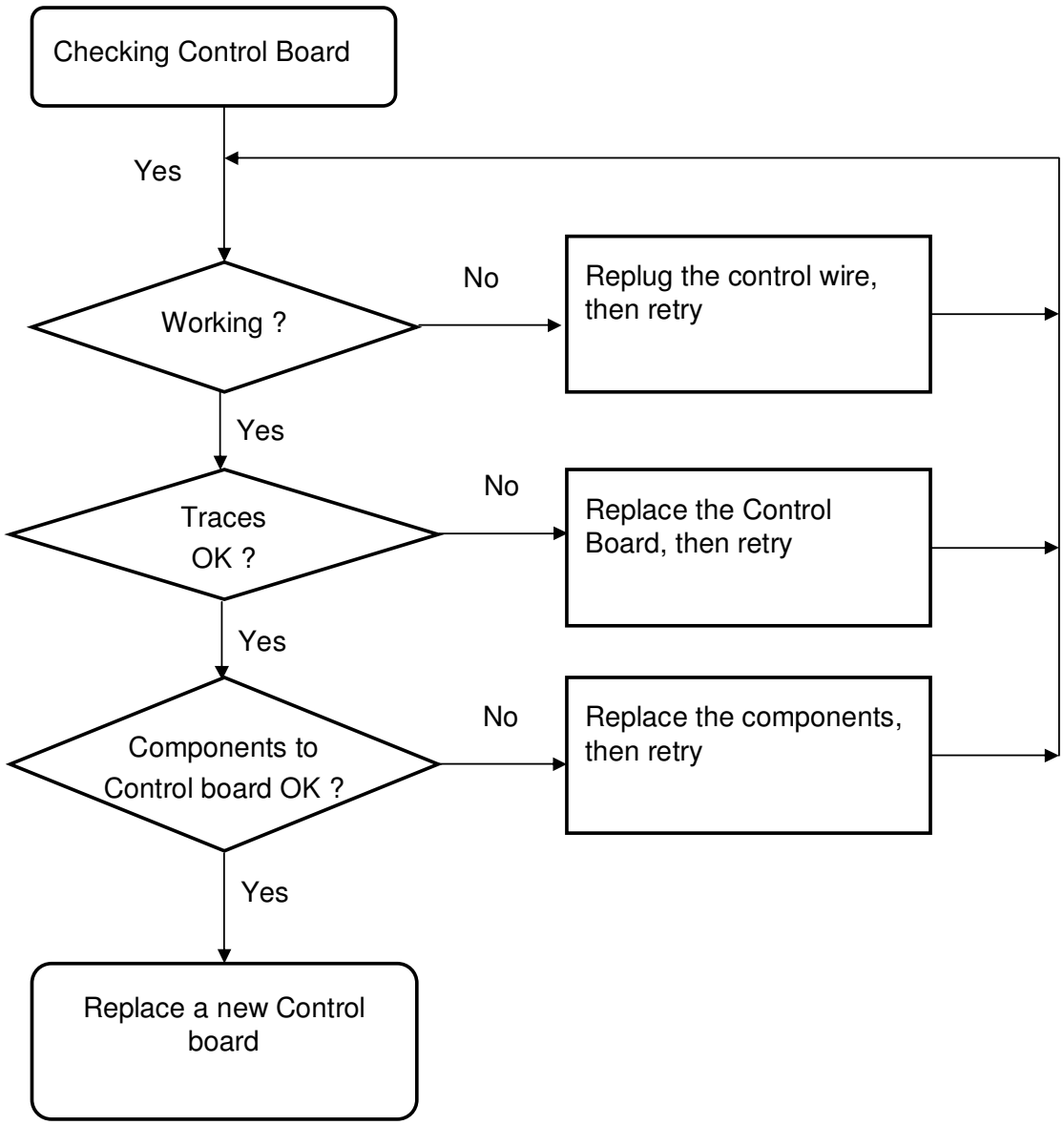
6.1.2 Check Control Board



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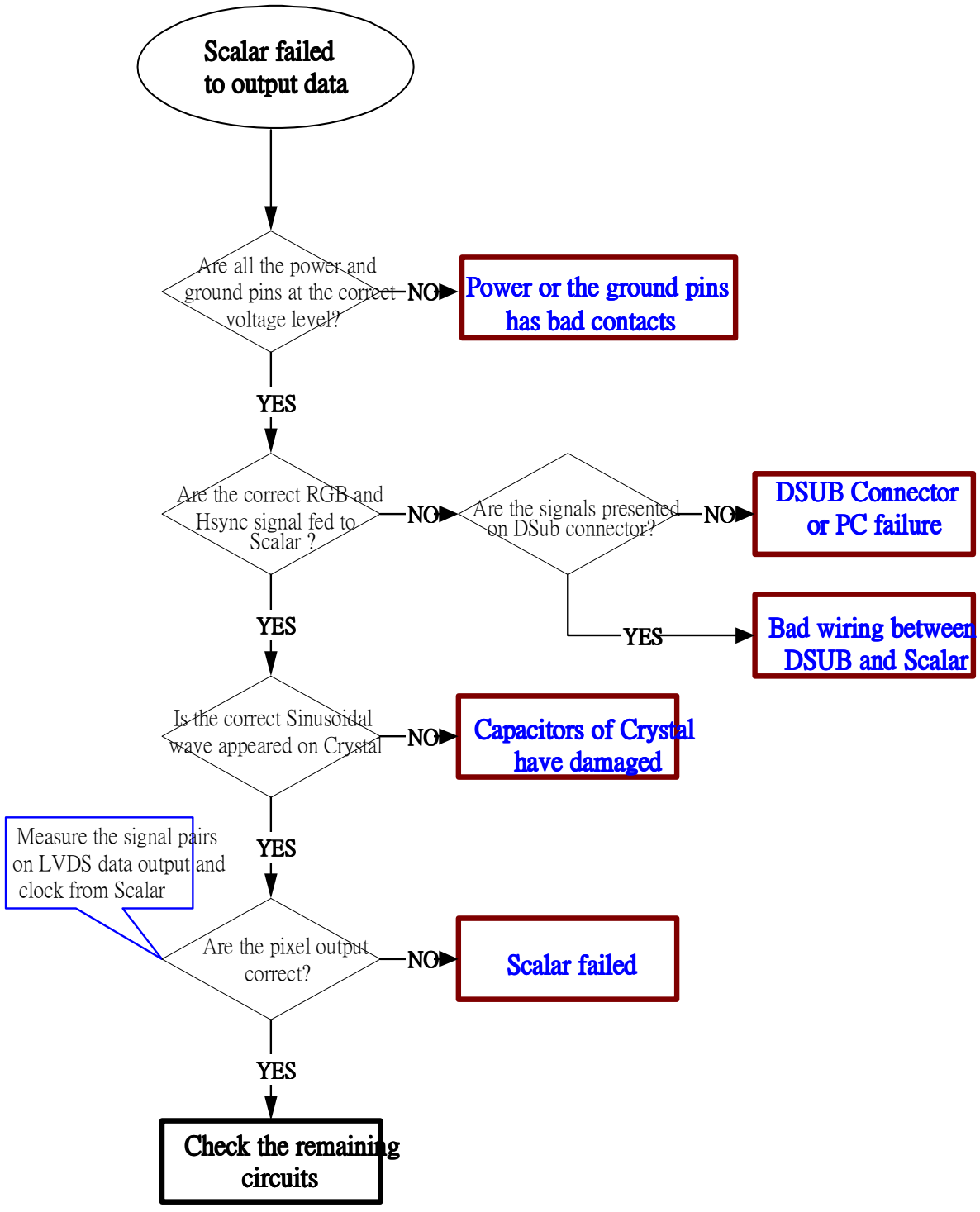
6.1.3 Check Scalar


Scalar failed to output data
Are all the power and ground pins at the correct voltage level?
NO
Power or the ground pins has bad contacts
YES
Are the correct RGB and Hsync signal fed to Scalar ?
NO
Are the signals presented on DSub connector?
NO
DSUB Connector or PC failure
YES
Bad wiring between DSUB and Scalar
YES
Is the correct Sinusoidal wave appeared on Crystal
NO
Capacitors of Crystal have damaged
YES
Measure the signal pairs on LVDS data output and clock from Scalar
Are the pixel output correct?
NO
Scalar failed
YES
Check the remaining circuits

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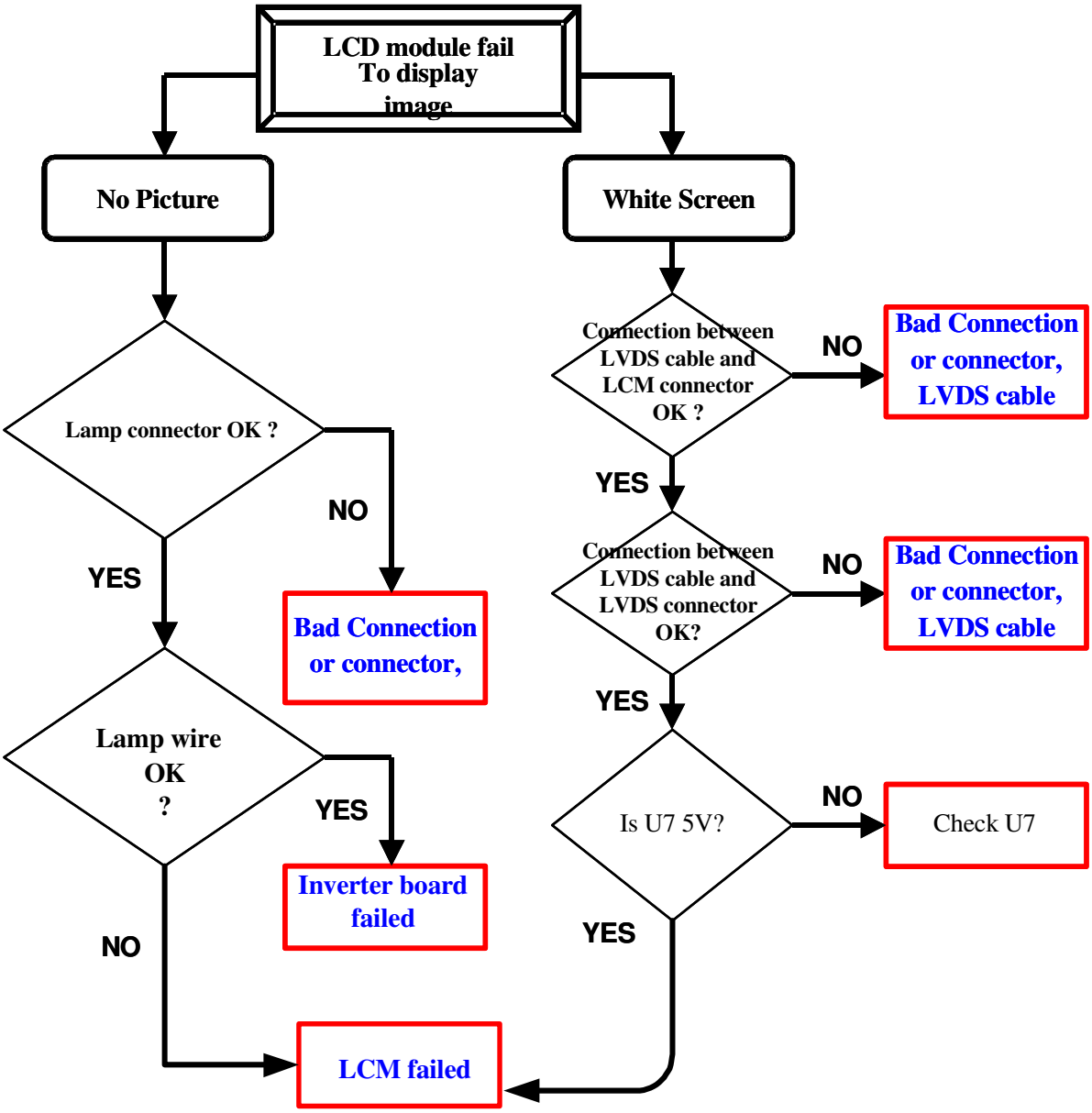
6.1.4 Check LCD Module



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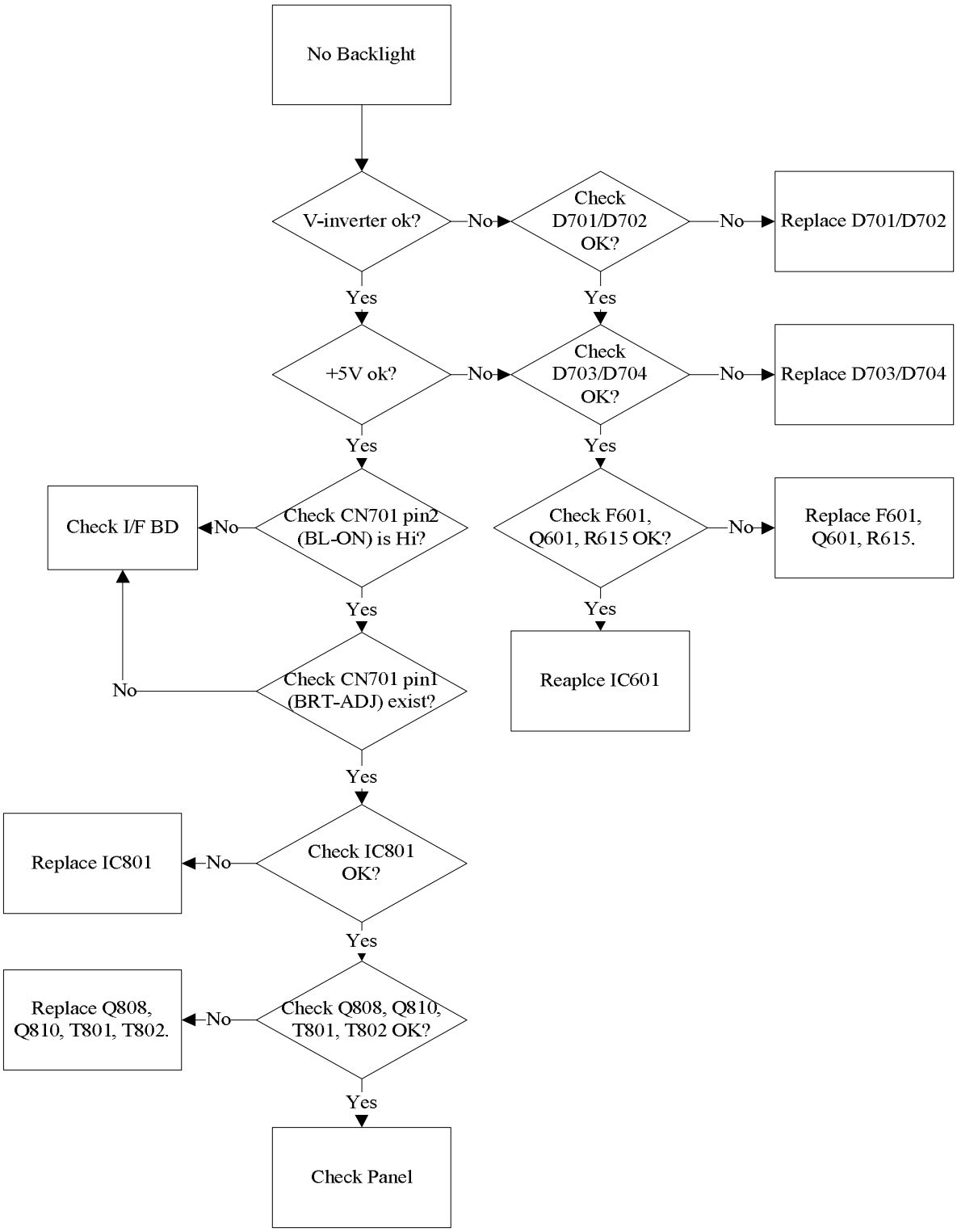
6.1.5 Power Board no work troubleshooting



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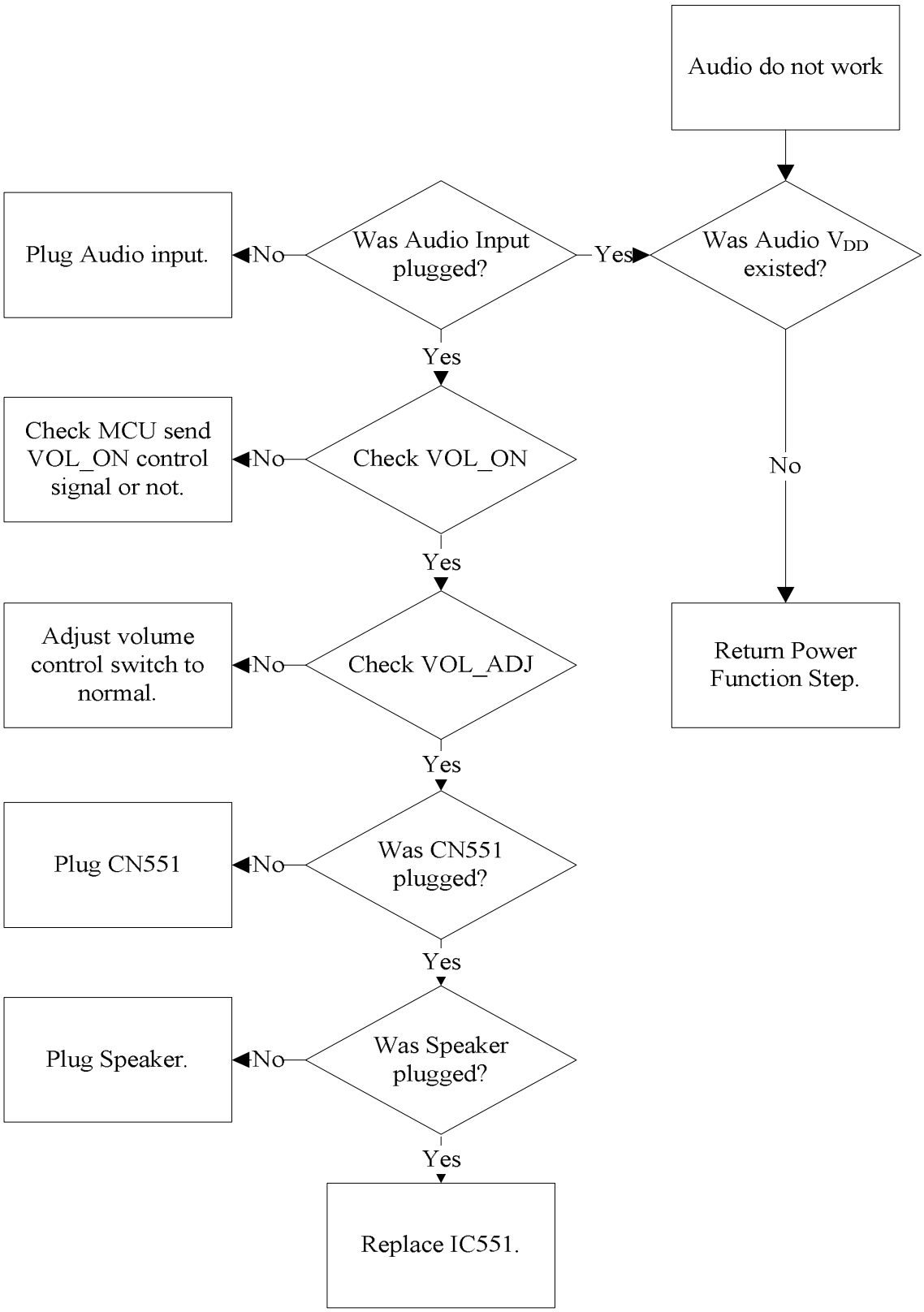
6.1.6 Audio Function



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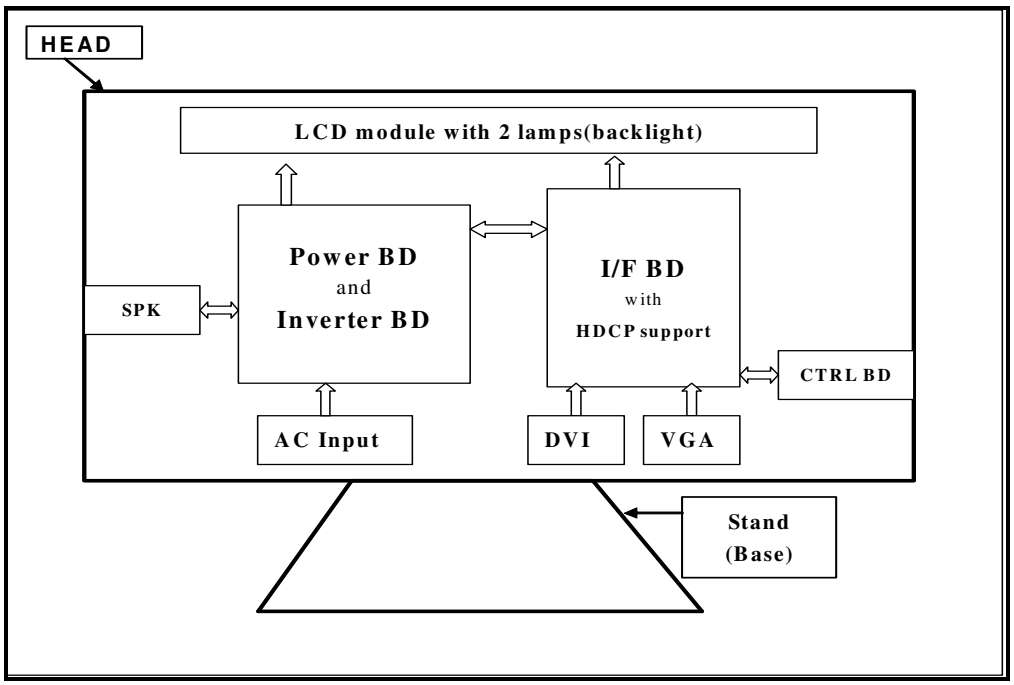
6.2 Circuit Operation Theory

I. Introduction

The X203H is a 20" W (1600x900), LCD type is TN+Film and Normally White, 16.7M colors(R, G, B 6-bit data + Hi-FRC data) TFT LCD with HDCP support monitor. It's have dual (D-SUB and DVI) interface LCD monitor with a 15 pins D-sub signal cable and 24 pin DVI signal cable which support HDCP function. It's compliant with VESA specification to offer a smart power management and power saving function. It also offers OSD menu for users to control the adjustable items and get some information about this monitor. The best function is to offer users an easy method to change input source, DDC/CI Enable and Auto Adjustment items well done just by pressing hot key, we called it "Input Select", "DDC/CI" and "Auto" which can manual controlled items.
X203H also offer DDC/CI function to meet VESA standard.

II. Block diagram

The X203H consists of a LCD module with 2 lamps, a power board, a control board, and an interface board. The block diagram is shown as below.



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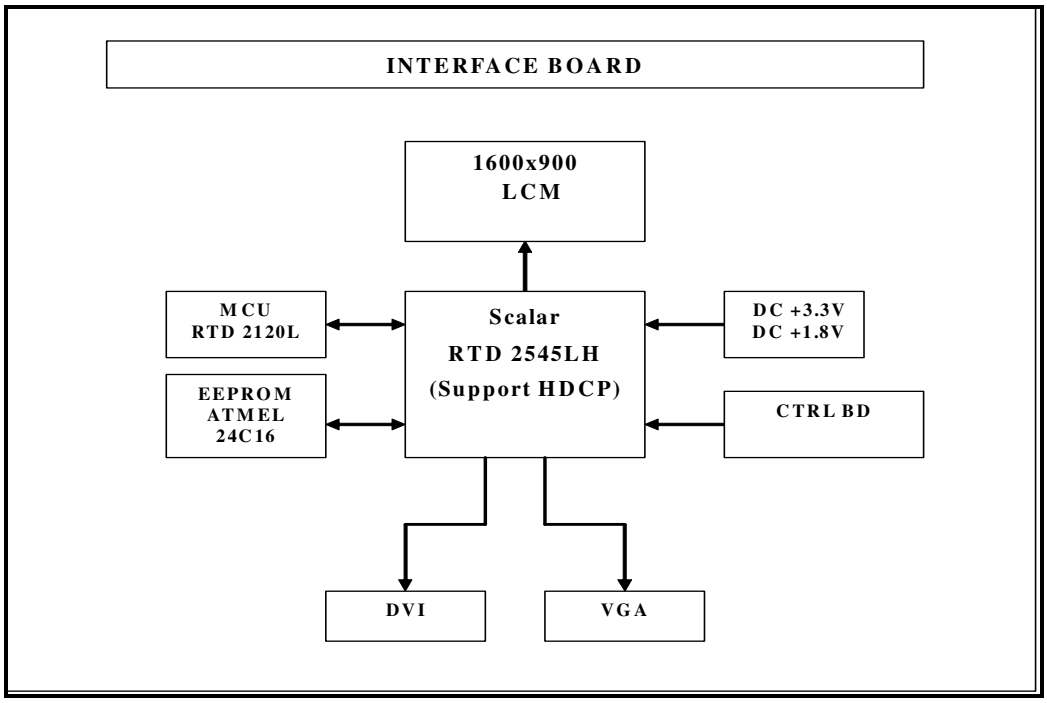
III. Circuit Implementations:

A.) THE MAIN BODY:

A-1.) Interface board block diagram :



(a) Circuit operations:

A basic operation theory for this interface board is to convert analog signals of Red, Green and Blue to digital signals of Red, Green and Blue. The scaling IC has internal A/D converter, internal OSD, built in LVDS transmitter and auto-detect input timing functions. A/D converter is convert analog signal to digital data. OSD is offering adjustable functions to end-user. Detect timing is for detect change mode. LVDS transmitter is used to compress the digital RGB data, the Hsync, Vsync and pixel clock generated by Scaling then output to LCD module. MCU stores source code and offers H/W DDC2Bi function & controls system processing. EEPROM is stored DDC and HDCP data, OSD common data and user mode data.

(b) IC introduction:

1.) DDC (Display Data Channel) function: We use DDC IC to support DDC2Bi function. DDC data is store in 24C02 (EEPROM). Those data related to LCD monitor specification. PC can read them by “SDA” and “SCL” serial communication for I²C communication for DDC2Bi.

2.) Scalar IC: There are A/D, TMDS receiver, HDCP, Scaling, OSD and LVDS transmitter functions built-in the RTD2545LH IC. Scaling IC is revolutionary scaling and color engine,

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capable of expanding any source resolution to a highly uniform and sharp image or down scaling from 1980x1020, combined with the critically proven integrated 8 bit triple-ADC and patented Rapid-lock digital clock recovery system. It also support detect mode and DPMS control.

3.) RTD2120L: Control unit, it controls all the functions of this interface board, just like the OSD display setting, the adjustable items, adjusted data storage, the external IIC communication, support DDC2Bi. .

4.) EEPROM: We use 24C016 to store all the adjustable data, user settings and HDCP Key and use 2 of 24C02 to store DVI and D-SUB EDID data.

A-2.) Control board introduction :

There are 6 keys for user's control which includes “Menu”, “Right”, “Left”, “Auto”, “Empowering”, and “Power”. The following descriptions are the introduction of these keys.

(1) “Menu” key: to enter sub-menus or select items.

(2) “Right” key: to select previous and to increase adjustment

(3) “Left” key: to select next and to decrease adjustment

(4) “Auto” key: to perform auto adjustment and Exit key

(5) “Empowering”: to Open the Acer eColor Management OSD and access the scenario modes

(6) “Power” key: to turn/off power of monitor

(7) LED: It indicates the DPMS status of this LCD monitor; green light means DPMS on (Normal operating condition). Amber light means DPMS off (Power Saving).

A-3.) Power board diagram:

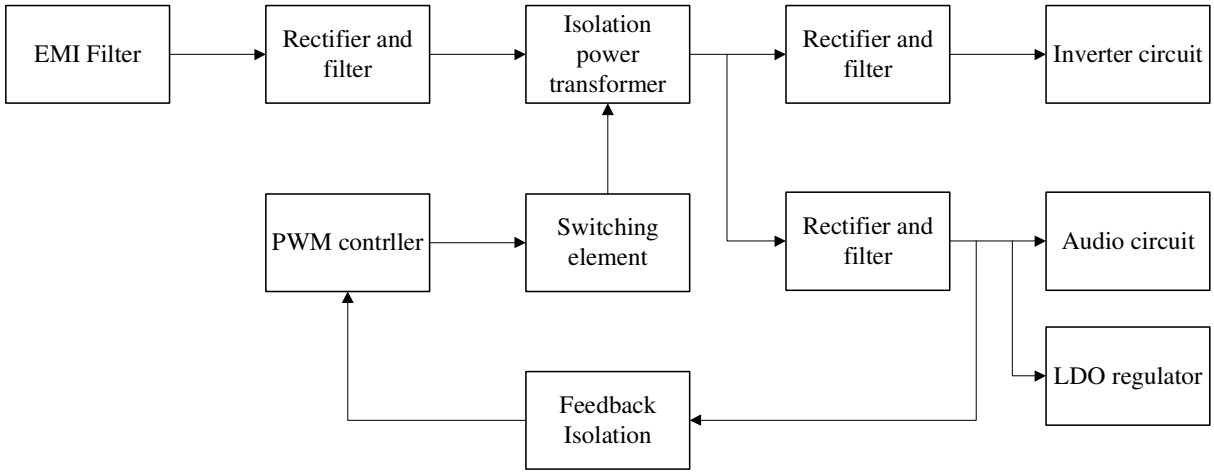

Fig.1

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#1 EMI Filter

This circuit (Fig.2) is designed to inhibit electrical and magnetic interference for meeting FCC, VDE, VCCI standard requirements.

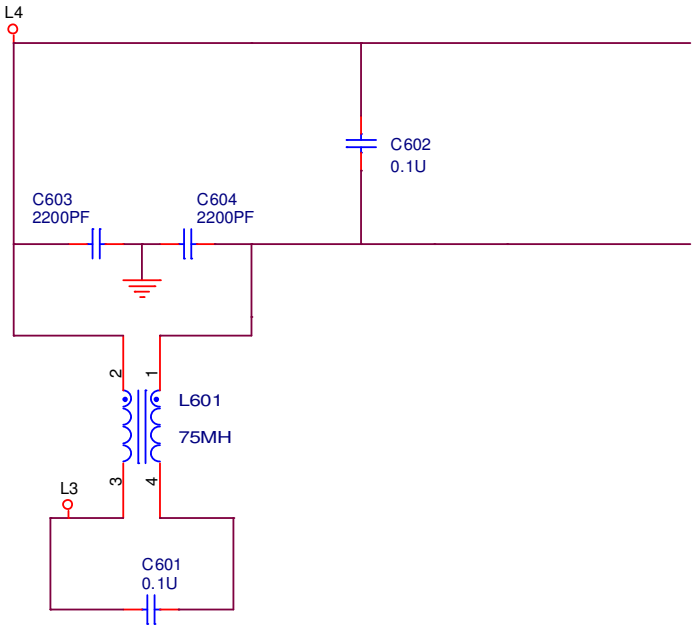

Fig.2

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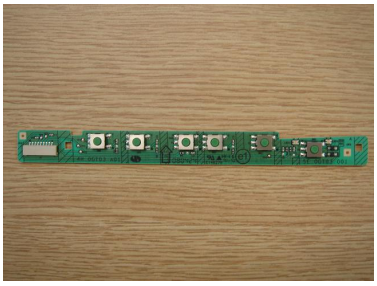
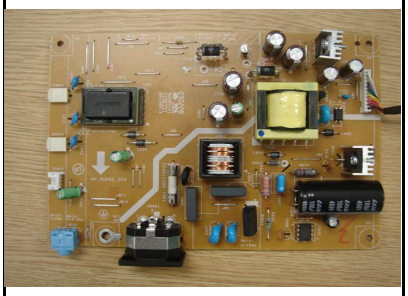
6.3 Spare Parts List

Picture	CATEGORY	DESCRIPTION	ACER PART NO.
	LCD	CCFL LCD SAMSUNG 20"W HD+ None Glare LTM200KT03 TBD LF 250nit 5ms 1000:1 2 CCFL(acer B/S)	LK.20006.006
Board			
	BOARD	CONTROL BOARD	55.LBJ0Q.004
	BOARD	POWER BOARD SEC AUDIO	19.LHC0Q.001
	BOARD	MAIN BOARD SEC DUAL WITH SPEAKER	55.LHC0Q.001

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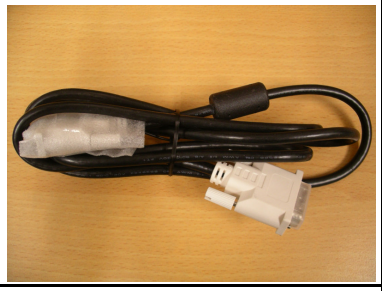
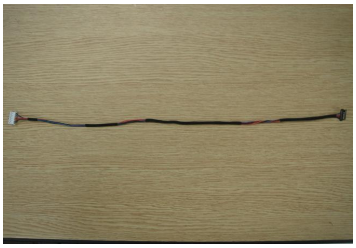
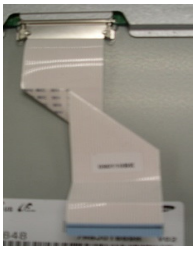
Cable			
	CABLE	POWER CORD US	27.LDW0Q.003
	CABLE	DVI CABLE	50.LBJ0Q.001
	CABLE	CABLE BETWEEN CONTROL BOARD AND M/B	50.LHC0Q.001
	CABLE	CABLE BETWEEN M/B AND POWER BOARD	50.LE10Q.001
	CABLE	CABLE BETWEEN M/B AND LCD PANEL	50.LGP0Q.001
	CABLE	SIGNAL CABLE	50.LBJ0Q.002

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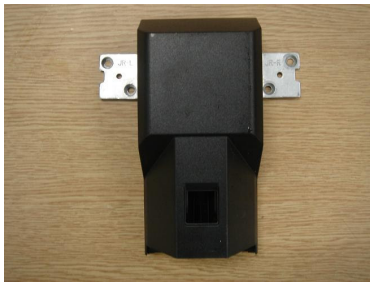	CASE/COVER /BRACKET ASSEMBLY	STAND NECK	60.LDX0Q.003
	CASE/COVER /BRACKET ASSEMBLY	STAND BASE DUAL	60.LDX0Q.010
	CASE/COVER /BRACKET ASSEMBLY	LCD BEZEL ASSY	60.LHC0Q.001
	CASE/COVER /BRACKET ASSEMBLY	BACK COVER SEC DUAL WITH AUDIO	60.LHC0Q.002

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Appendix 1 – Screw List / Torque

(A) **STANDARD SCREW TORQUE SPEC.**

ITEM	P/N	DESCRIPTION	Color	Mounting Material	TORQUE (KG-CM)	HOLE SIZE (MM)	Screw Head
1	8F.205B4.019	SCRW MACH HEX #4-40*0.3" N	Ni	Metal; D-SUB;DVI Connector	5.0±0.6	#4-40	X
2	8F.00518.100	SCRW TAP W/FL M3*10L(S3.8) ZN	NI	Metal	None tread：8～10 Have tread: 3～4 Aluminum: 4~5	∅2.68±0.03	#2
3	8F.1A556.8R0	SCRW MACH PH M4*8L NI NYL	NI	Metal	11.0±1.0	M4*0.7	#2
4	8F.5A356.8R0	SCRW MACH FH M4*8L B-ZN NYL	B-Zn	Metal	9.0±1.0	M4*0.7	#2
5	8F.5A422.2R4	SCRW MACH FLAT-P M2*2.4L ZN	Zn	Plastic	1.0±0.1	∅1.7±0.05	#1
6	8F.00273.6R0	SCRW TAP PH F/10WSH M3*6L C-ZN	C-Zn	Metal	None tread：8～10 Have tread: 6～8 Aluminum: 4~5	∅2.68±0.03	#2
7	8F.VZ524.6R0	SCRW TAP FLAT+EXT M3*6L C-ZN	C-Zn	Metal	None tread：8～10 Have tread: 6～8 Aluminum: 4~5	∅2.68±0.03	#2
8	8F.5A356.120	SCRW MACH FH M4*12L B-ZN NYL	B-Zn	Metal	11.0±1.0	M4*0.7	#2
9	8F.5A456.8R0	SCRW MACH FLAT M4*8L C-ZN NYLO	C-Zn	Metal	11.0±1.0	M4*0.7	#2
10	8F.WA314.8R0	SCRW TAP CAP M3*1.34P*8L B-ZN	B-Zn	Plastic	5.0±1.0	∅2.35±0.05	#2
11	8F.PA526.120	SCRW TAP PAN M4*12L NI	Ni	Plastic	7.5±0.5	∅3.4±0.05	#2
12	8F.XA326.100	SCRW TAP FLAT M4*10L B-ZN	B-ZN	Plastic	7.5±0.5	∅3.4±0.05	#2
13	8F.XA314.8R0	SCRW TAP FLAT	B-ZN	PLASTIC	4.5±0.5	∅2.35±0.0	#2

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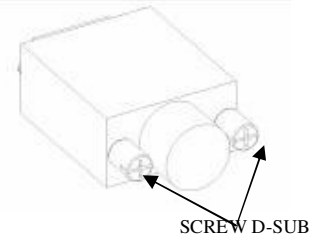
		M3*1.34P*8L B-ZN				5	
14	8F.5A224.6R0	SCRW MACH FLAT M3*5L ZN	ZN	METAL	Side mount:3~4 Other: 4±0.6	M3*0.5	#2
15	8F.00010.161	SCRW TAPTILE TRS W/EXT M4*8L	NI	METAL	10±1.0	M4*0.7	#2

(B) **SPECIAL SCREW TORQUE SPEC.**

ITEM	P/N	DESCRIPTION	MOUNTING MATERIAL	TORQUE (KG-CM)	HOLE SIZE (MM)	Screw Head

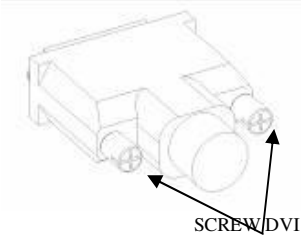
*SCREW Q'TYPE AND POSITION REFERRED TO C328.
*NOTES:
1. (A)STANDARD SCREW TORQUE SPEC.
2. (B)SPECIAL SCREW TORQUE SPEC.
3. T: TAPPING SCREW.
4. M: MACHING SCREW.

D-SUB Connector
SCREW TORQUE SPEC.



SCREW TORQUE: 1.2±0.3 (KG-CM)

DVI Connector
SCREW TORQUE SPEC.



SCREW TORQUE : 1.2±0.3(KG-CM)

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Appendix 2 – Physical Dimension Front View and Side view

Fig. 1 Physical Dimension Front View and Side view

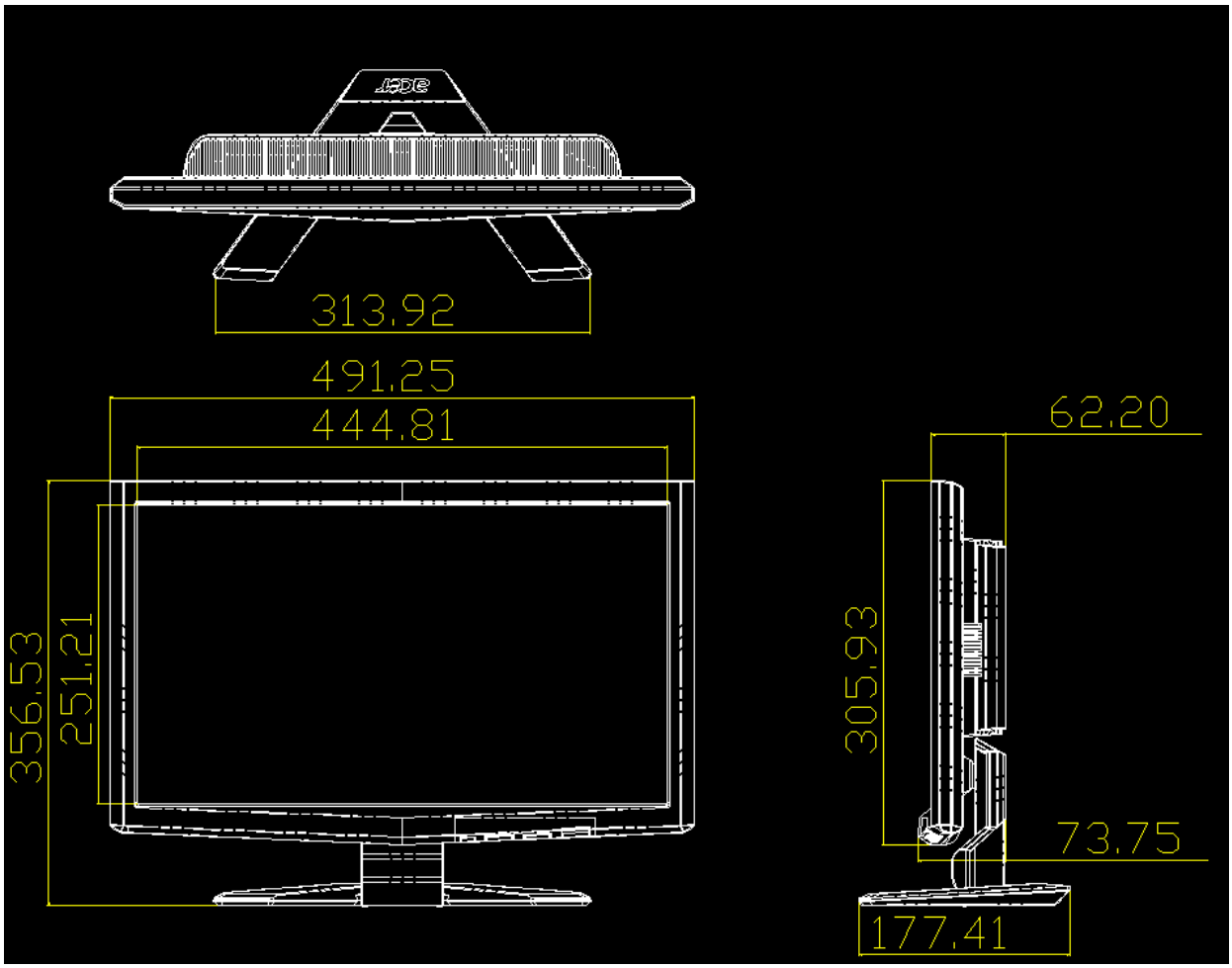

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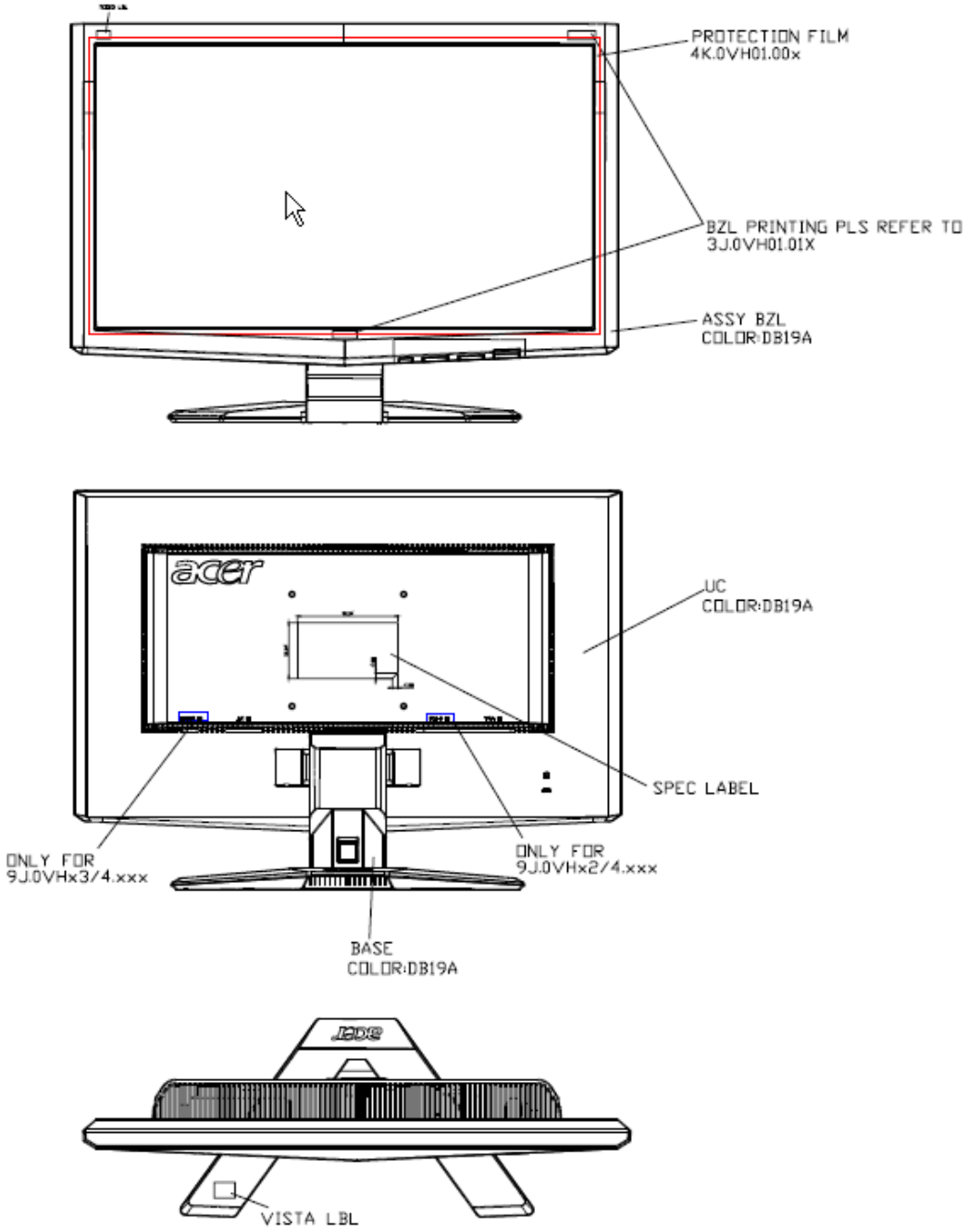
Fig. 2 Appearance Description



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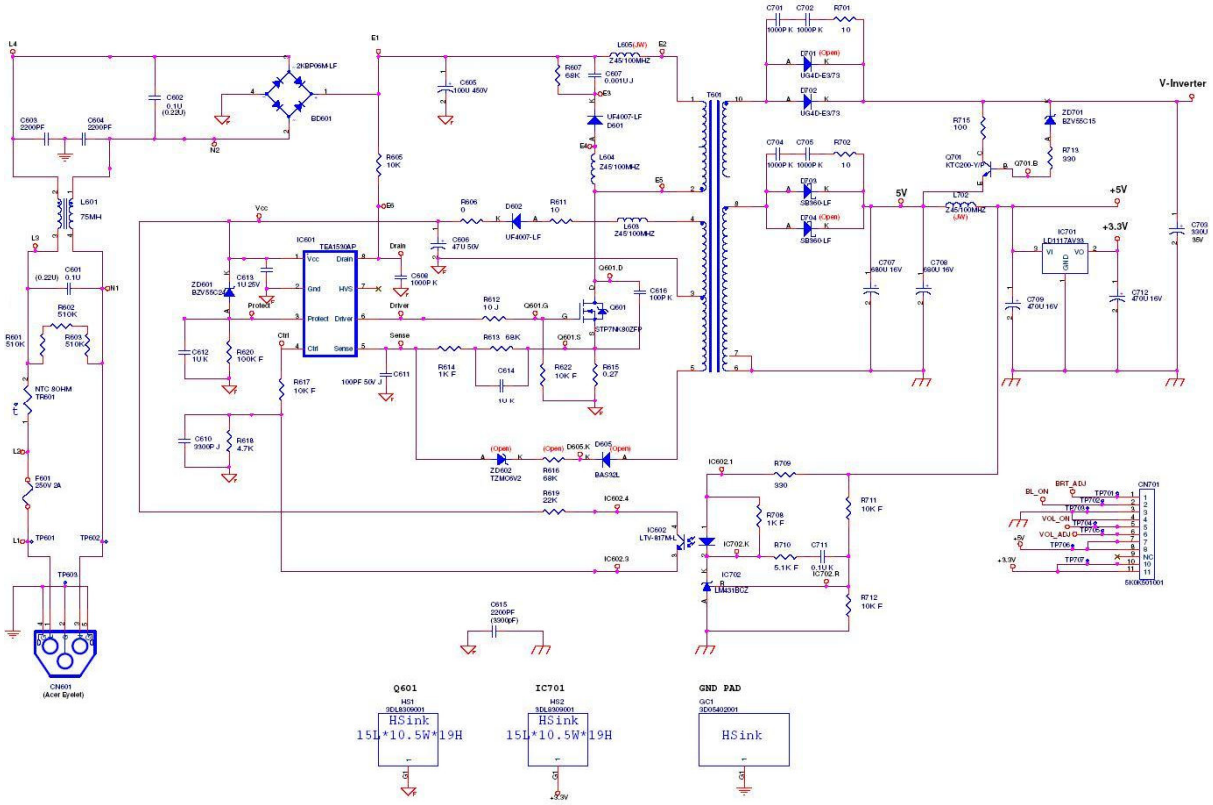
Appendix 3 – Interface Board



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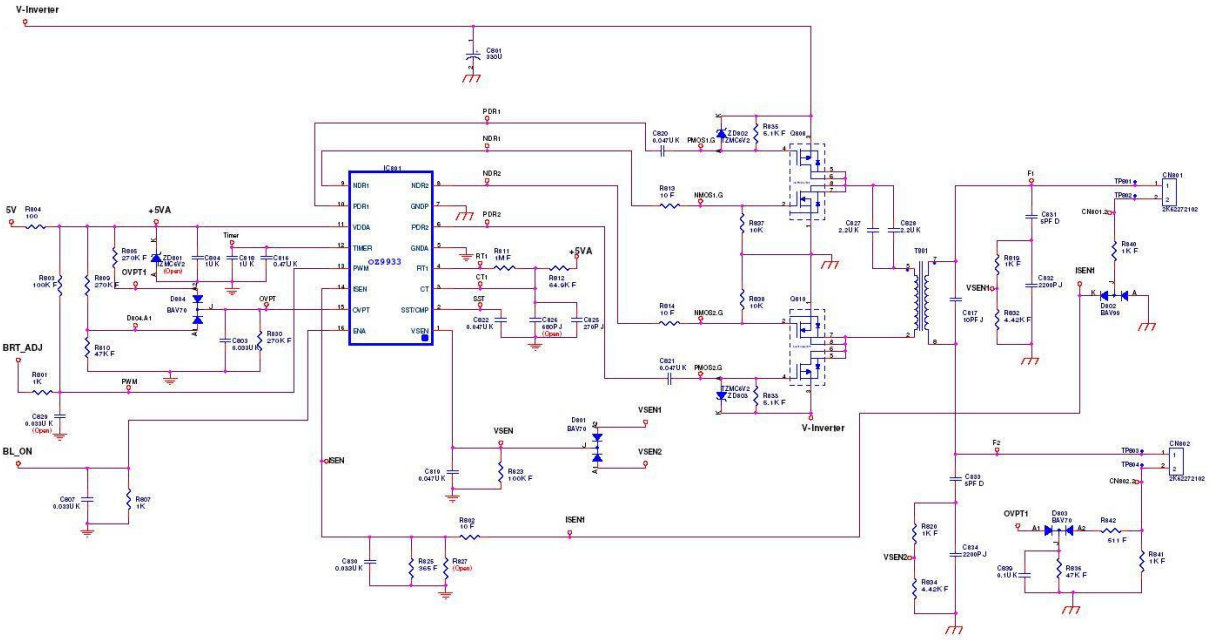

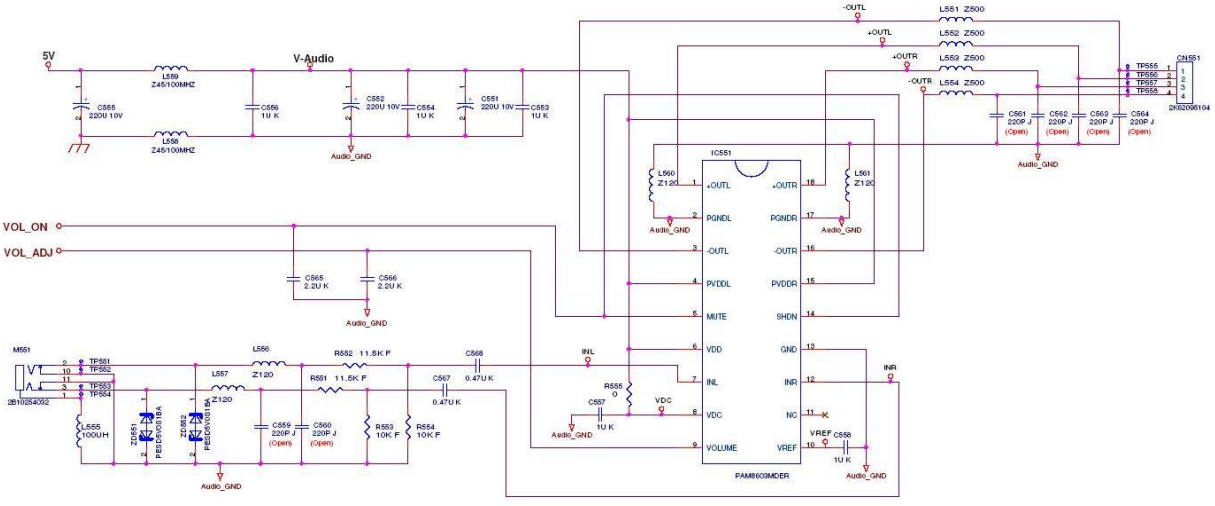

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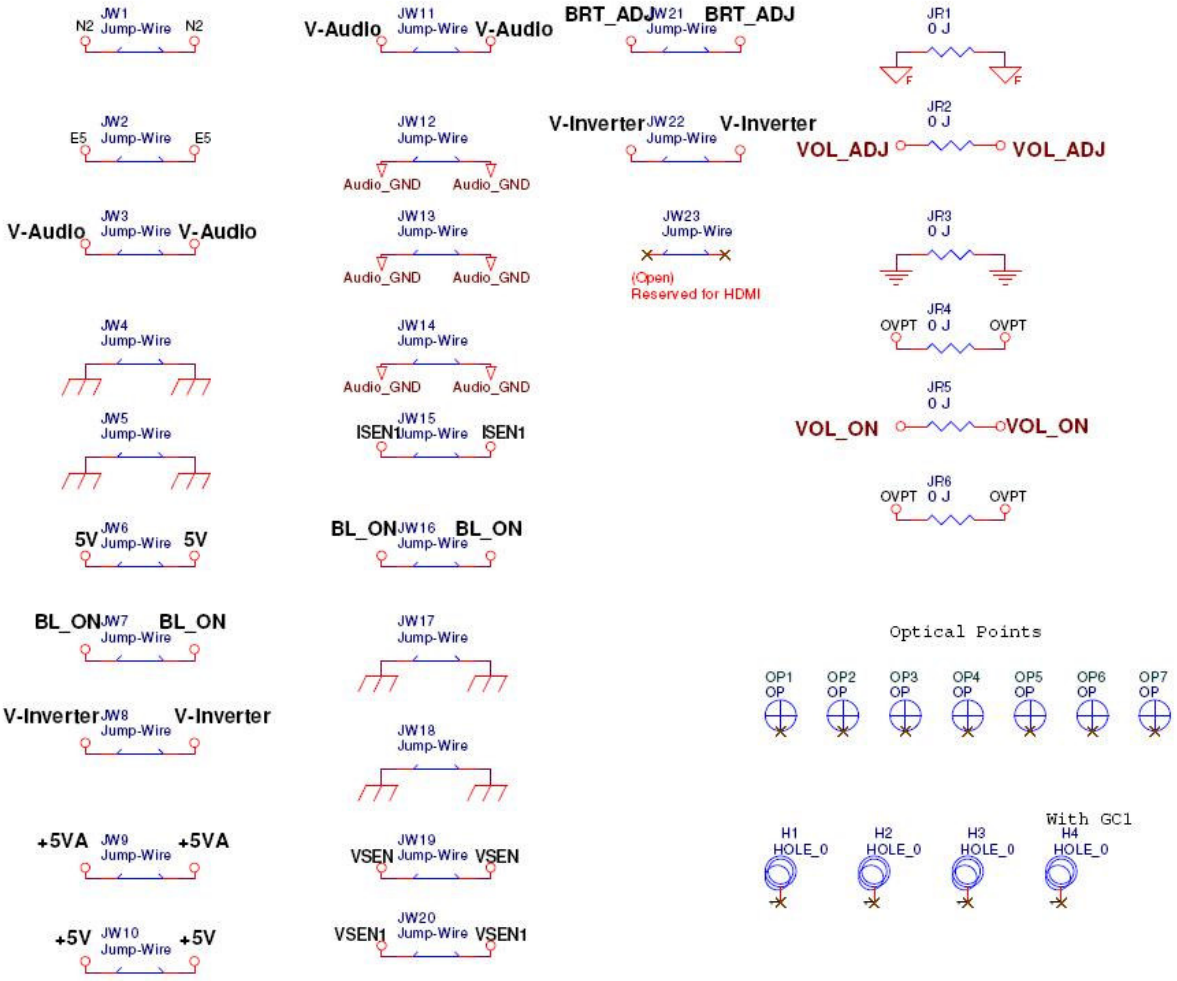

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